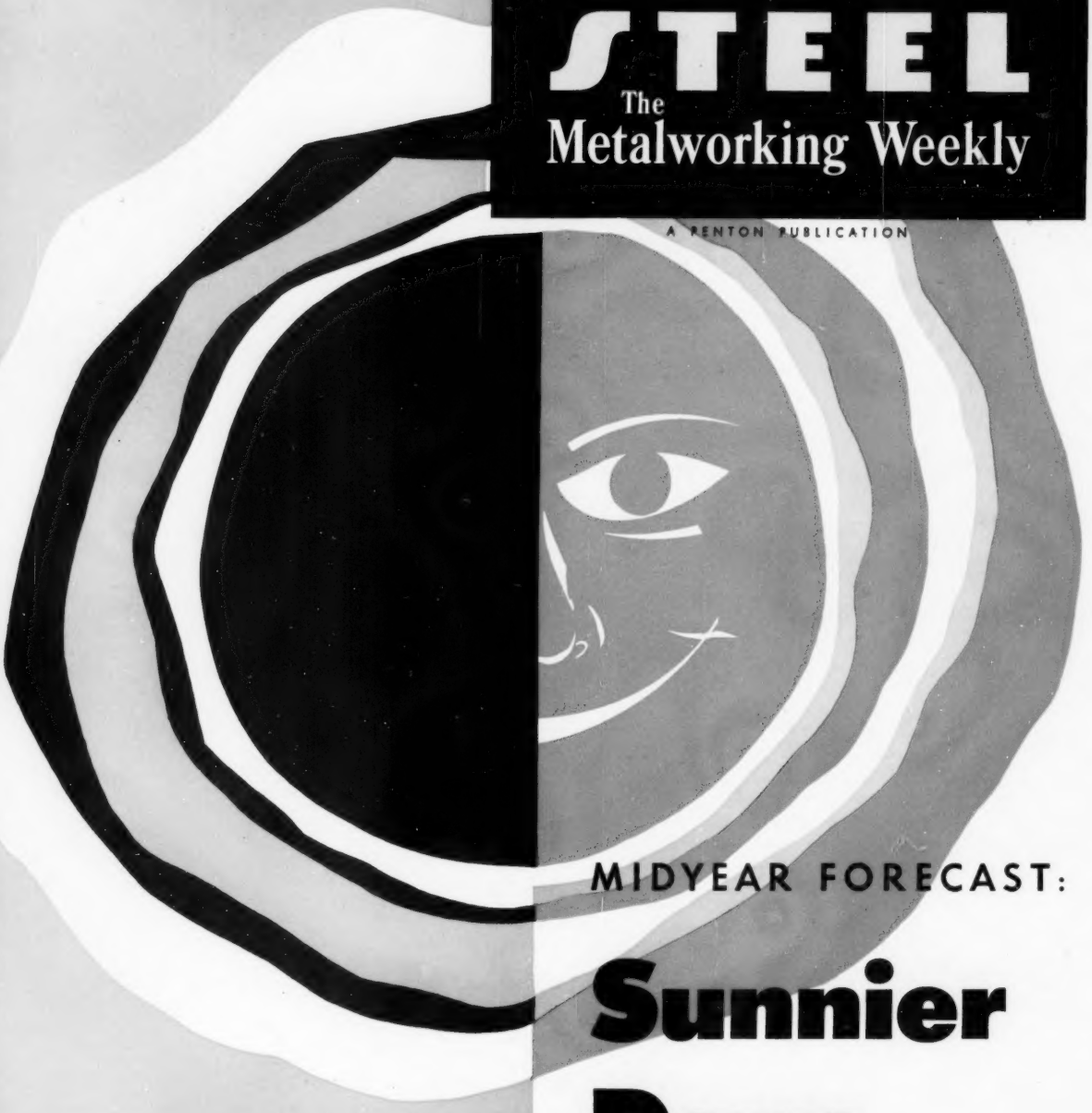
JULY 1, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



MIDYEAR FORECAST:

Sunnier Days Ahead...

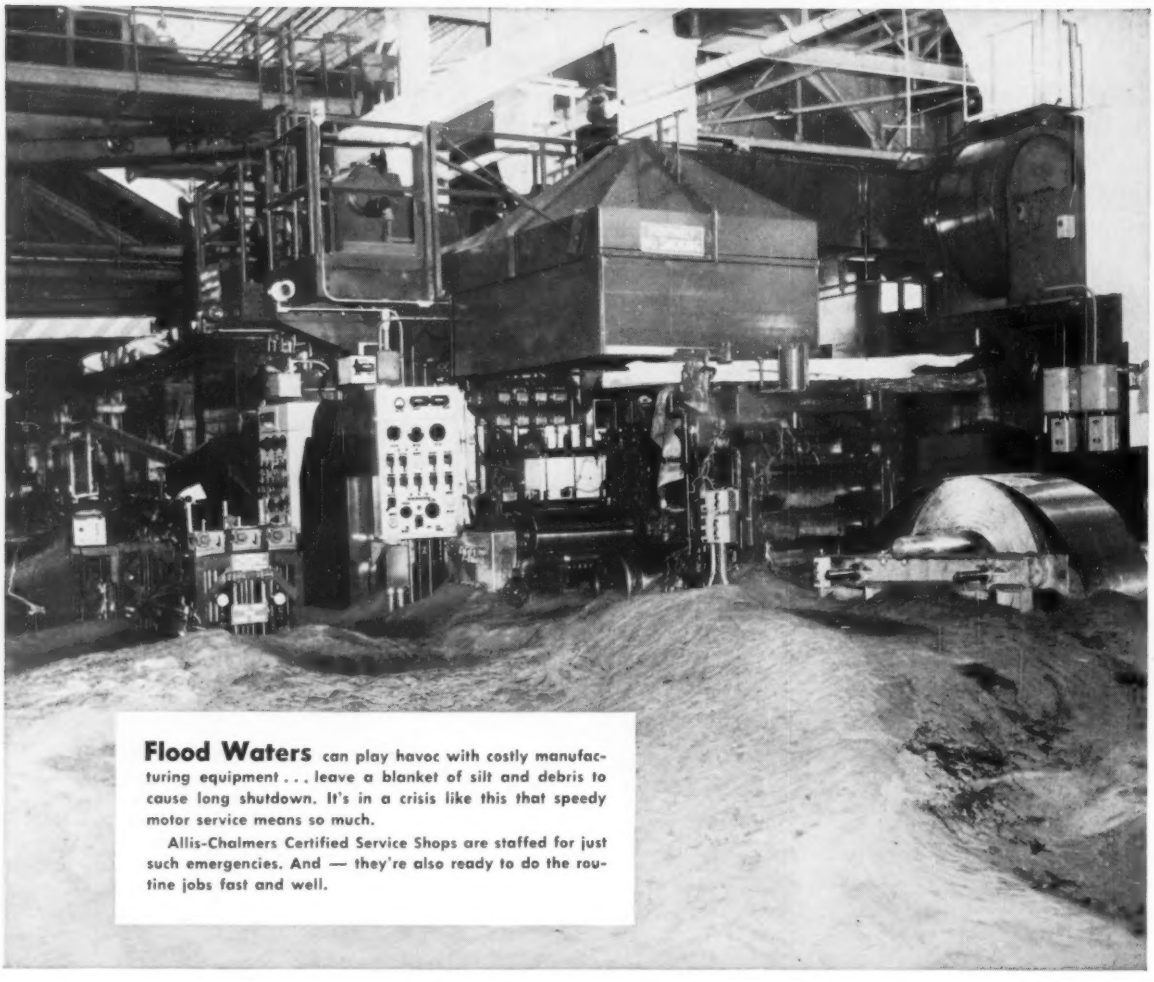
—page 33

● Ultrasonic Tests Reduce In-Process Waste —page 66

● Stability Seen for Component Inventories —page 99

Allis-Chalmers "Certified" Service Shops:

When you need motor help



Flood Waters can play havoc with costly manufacturing equipment . . . leave a blanket of silt and debris to cause long shutdown. It's in a crisis like this that speedy motor service means so much.

Allis-Chalmers Certified Service Shops are staffed for just such emergencies. And — they're also ready to do the routine jobs fast and well.

Catastrophe or Routine Service

Whether it's complete catastrophe or a normal repair job, fast motor service can make a difference of thousands of dollars in lost production. As near as your phone is one of more than 100 Allis-Chalmers Certified Service Shops — ready to help save you production dollars.

These shops have manpower and equipment to perform repairs to Allis-Chalmers rigid standards. Their ability and integrity have been proven by years of service. They can do a good, fast job on any motor or generator, of any make. To locate the Shop in your area, call your nearby A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5300

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

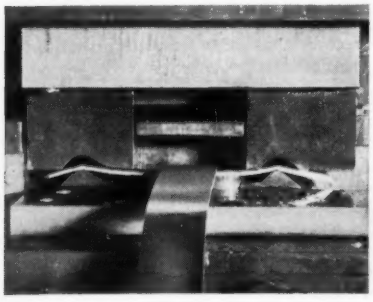
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

Maker of Beer-Can Openers Likes Economy of Lehigh H

Precision Manufacturing Company, San Antonio, Texas, needed a tool steel to produce a strong, long-wearing die with which one of their customers could economically manufacture beer-can openers. They put the problem up to their local tool-steel distributor, Earle M. Jorgensen Co., who recommended Bethlehem Lehigh H. "Our experience with this air-hardening grade has shown us how it stands up," the Jorgensen people said. "It's resistant to wear and, besides, has low distortion in heat-treatment."

The die was heat-treated by Cook Heat Treating Company, Houston, Texas. It was placed in service in a 56-ton press, where it was fed C 1035 cold-rolled strip, 0.065 in. thick. Performance was excellent, the die performing economically at the high speed at which the press operated. About 800,000 pieces were produced between grinds.



Lehigh H, our high-carbon, high-chromium grade of air-hardening tool steel, is ideal for tough assignments because of its outstanding wear-resistance and toughness. It is well known for its minimum distortion in heat-treatment, and high compressive strength.

TYPICAL ANALYSIS

Carbon 1.55	Molybdenum 0.80
Chromium 11.50	Vanadium 0.40

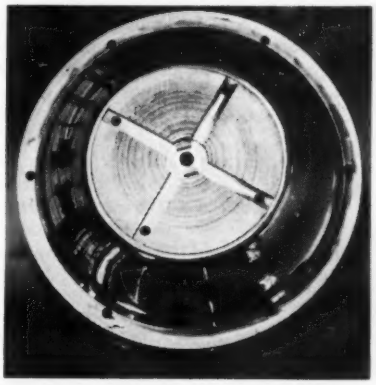
Look into the advantages of Lehigh H by giving it a try. Chances are good that your local Bethlehem tool steel distributor has Lehigh H in stock. Give him a call.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Follow Up With Temper When Drilling Hardened Tools

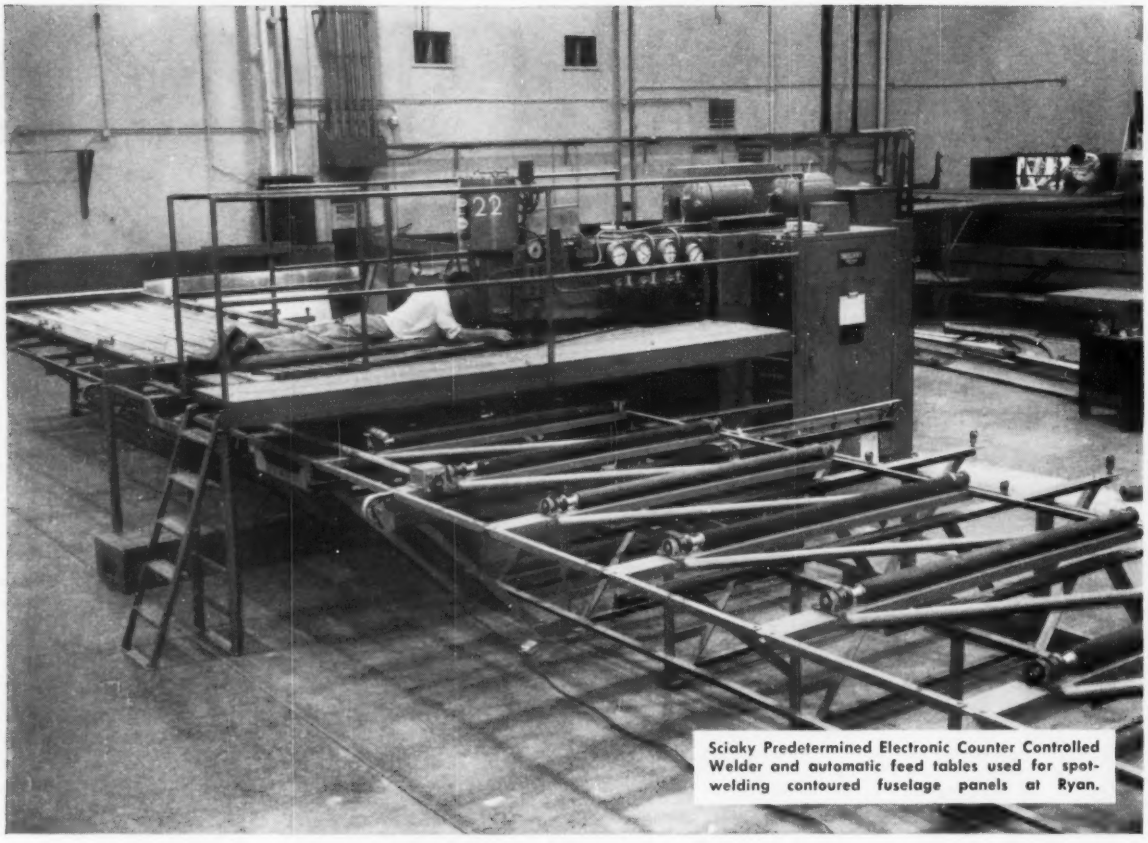
When necessary to drill holes in hardened tools or dies to incorporate dimensional changes, such drilling is usually done with a triangular drill made of a cast stellite or a sintered carbide. This type of drill operates by generating frictional heat sufficient to locally anneal the steel, so that the cutting edges can scrape the metal away in the path of the drill. All tool steel grades, regardless of how high the hardness developed by heat-treatment, can be drilled in this manner.

It is obvious that such a procedure will produce stresses in tools or dies which, because of heat-treatment, already contain residual stresses. It is important, therefore, that the drilling operation on hardened tools always be followed by a tempering operation. Tempering should be carried out at a temperature equal to, or slightly below, the final temper used in the original heat-treatment operations.



Lustre-Die Provides High Sheen When Making Plastic Parts

This core for a plastic injection mold, made by Interstate Mold & Hobbing Co., Union, N. J., is for use in manufacturing a decorative bowl for household use. It is made of Lustre-Die, an electric-furnace steel of well-balanced analysis, which we alloy-fortify to increase its depth of hardenability and mechanical properties. Use Lustre-Die when you want unusually high sheen on plastic parts. You'll like it.



Sciaky Predetermined Electronic Counter Controlled Welder and automatic feed tables used for spot-welding contoured fuselage panels at Ryan.

COMPLEX SPOTWELDING PROGRAM AT RYAN IS SEVERE TEST FOR NEW SCIAKY COUNTER CONTROL

Ryan Aeronautical Company, San Diego, California has achieved a significant first in resistance welding—automatic spot welding of large contoured fuselage panels for the Boeing KC-135 and "707" Jets.

Referring to their new Sciaky Counter Controlled Welder, Mr. Bob Fullerton, Ryan's Senior Welding Engineer, stated, *"This is one new welding development that really does what the advance announcements promised."*

PRECISE CONTROL

Early in the program, it became obvious that precise control of all welder functions and absolute production consistency of welding was essential. Introduction of the new Predetermined Electronic Counter Controlled Welder by Sciaky helped solve this problem.

Here, for the first time, is a welder in which functions are controlled to a fraction of a cycle of alternating current. Control settings are realized with exactness. The unvarying accuracy of counting is maintained throughout the entire range for the longest run at the highest production rate. Any production control setting is readily reproducible at any time.

CONSISTENT, SAFE WELDS

The consistently safe welds produced by the Sciaky Counter Weld Control are essential to the Ryan program since the skin is a load-bearing member. In addition, the size of the assembly—largest every sub-contracted in the industry—will not tolerate even the possibility of rejects due to imperfect welds.

The importance of consistently perfect welds is emphasized by the tremendous number of spotwelds in the aft fuselage sections of the Boeing jet tanker-transports. Approximately 77,000 spot welds are required to join skins to skins, skins to doublers and stringers, and bulkhead components together.

TAPE COMMAND OF WELDING OPERATIONS

Welding operations on the various assemblies can be controlled by a tape command unit providing complete piece part positioning in all directions. Automatic interlock between positioner and welder is required. This would provide more automatic operation.

COMPLEX TOOL-UP

Handling and positioning the aluminum skins also presented a major problem. Ryan solved this by installing huge positioning tables with push button controls to permit automatic feeding.

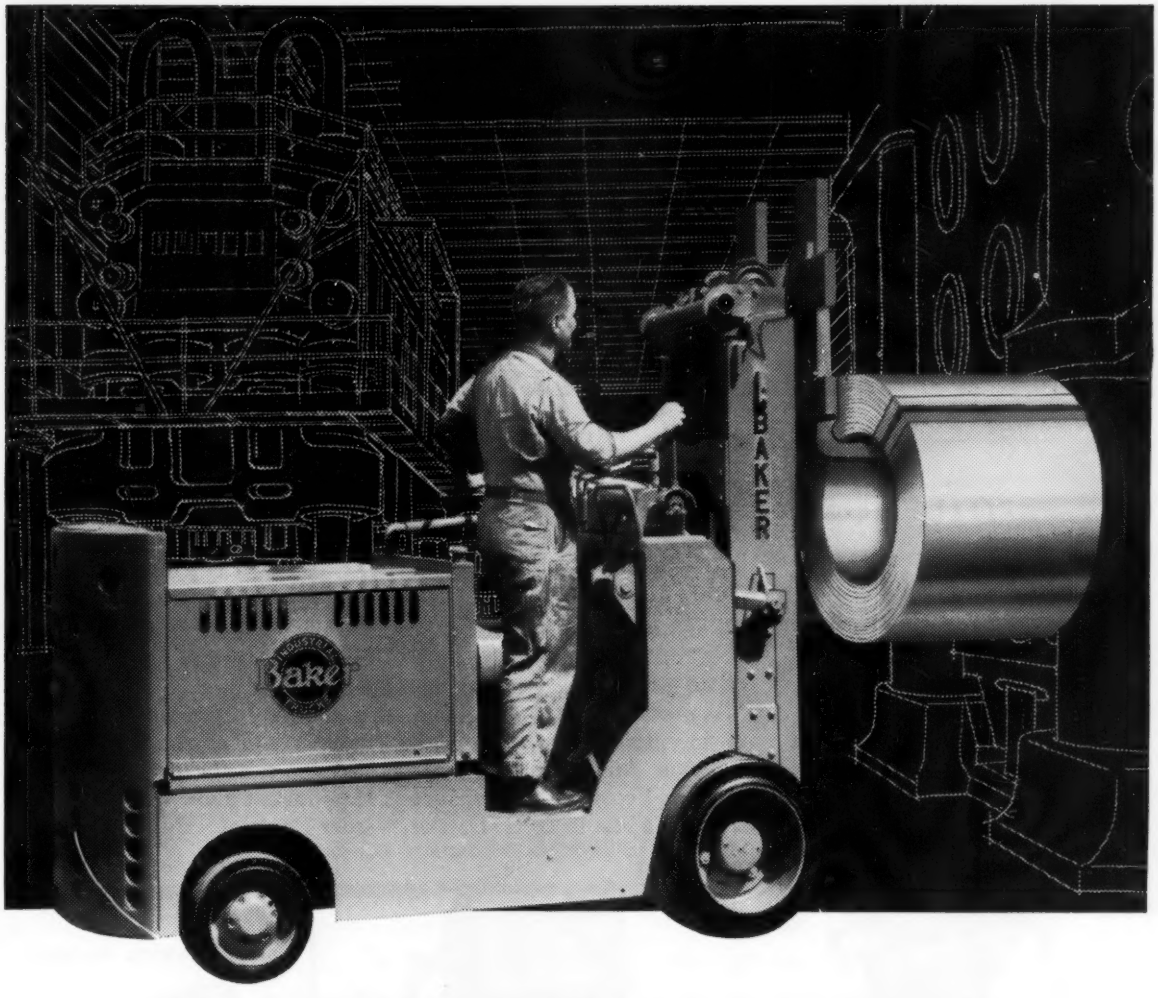
The characteristics and consistent operation of the Sciaky Counter Controlled Welder combine perfectly with the automatic abilities and consistency of the Ryan positioning table to satisfy the requirements of this complex production assembling operation.

LITERATURE AVAILABLE

Technical bulletins completely describing the new Sciaky Predetermined Electronic Counter Weld Control are available. Write on your company letterhead requesting Bulletins 338 and 339.

SCIAKY® *Helps Put Profit Into Manufacturing*

Sciaky Bros., Inc., 4909 West 67th St., Chicago 38, Ill., Portsmouth 7-5600



BAKER "JOM"—a BIG truck for efficient handling of BIG loads up to 10,000 pounds

Here is a rugged, heavy-duty fork or ram truck designed specifically for dependable handling of big, heavy loads. Capacities 7000, 8000 and 10,000 pounds.

Travel motor designed and built by Baker for grueling heavy service has high overload capacity. Five forward and reverse speeds. Foolproof electric interlock makes it impossible to start in high . . . assures smooth starts, protects motor, truck, and load. Automatic power shut-off and braking provides added safety when operator leaves his position.

Power steering makes the JOM easy to operate, reduces operator fatigue, means more work. Easily manipulated levers are conveniently located for greatest safety and most efficient operation. Low-cut design of the JOM gives the operator complete all-around vision of the load and road at all times.

Frame is of heavy gauge steel welded into a rigid one-piece assembly. Bumper counterweight is integral part of the frame for extra strength and stability.

Service time and costs are further reduced because all components are easily accessible . . . not hidden or covered by the frame. Write for Bulletin 1328.

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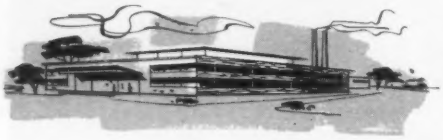
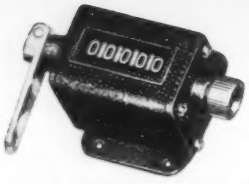


No Two Plants are alike...

but all can count on VEEDER-ROOT

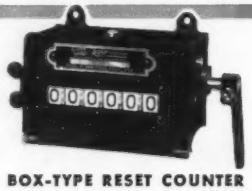
Sure, everybody's manufacturing problems are "different." But when these problems involve mechanical or electrical *Count*rol, they can *all* get the right answer from the same man . . . the Veeder-Root Distributor.

You will find that this man is tops in his field. He knows industry, and he knows how to adapt and apply standard Veeder-Root Counters to all types of production machines and processes, to give you exactly the facts-in-figures you need. If it's a question of quality, volume, cost inventory, production, wage or incentive payment, remember that *you're never sure unless you count.* And remember that the man you can always count *on* is your Veeder-Root Distributor. If you don't know who he is, just drop a line to D. G. Dresser, Veeder-Root Inc., Hartford 2, Conn.



SMALL RESET COUNTER

A compact, rugged reset counter for moderate duty in parts inspection, quality control, conveyors, machine tools, light presses, etc.
Dimensions: 1¾" long, 1 19/64" high, 1 7/16" wide.
Speed: Up to 1000 counts per minute.



BOX-TYPE RESET COUNTER

For punch press installations, conveyors, metal-working equipment, die casting, plastic-molding, rivet, spring and wire machining, or any installation requiring a heavy duty counter.
Dimensions: 4¼" long, 2 5/32" high, 3⅜" wide.
Speed: 500 counts per minute.

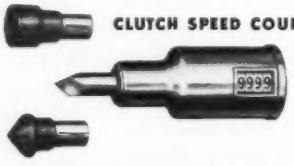
RESET MAGNETIC COUNTER

For remote indication of machine operation from plant to office.
Dimensions: 3 15/16" long, 2½" high, 1⅝" wide.
Speed: Up to 1000 counts per minute.
Coils: 110V-AC are standard. Other voltages are available. Panel mounting feature also available.

HAND TALLY

For quick spot-checks of production or performance.
Dimensions: 1 17/64" long (to end of reset knob), 1¾" deep, 2" high.
Counts one for each depression of the thumb lever, and resets to zero by a turn of the knob.

CLUTCH SPEED COUNTER



For checking to make sure that the machine is operating at the required R.P.M.
Dimensions: 3¼" long, ⅞" max. diameter. Non-Reset.
Internal clutch operates counter only when rubber tip is pressed against the shaft.

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behind the scenes

Star Spangled Stuff

Because the business press has never been too forward in the matter of taking solemn and corny note of the Fourth of July, it has been our custom to raise a squeaky cheer in this corner when that Great Day rolls around. Perhaps it is rather silly to pay homage to a rabble of ragged Continentals and a group of apprehensive patriots by waving flags, hollering a great deal about a musty old document written 181 years ago and listening to stereotyped oratory. You can't shout "Hooray!" without being pegged as a square, and if you take time out to remember the occasion, you might miss the next traffic light.

Perhaps the best way to draw grateful attention to the Fourth of July is to sneak up on it.

We did a little research on that musty old document mentioned a moment ago and learned that much of it was inspired by men long, long dead. It represents the wisdom of the ages. This is how it came about.

Jefferson's Committee

Red haired Tom Jefferson dipped his quill, cocked an eye at his shadowy guests from the past, and began writing. It was stinking hot in Philadelphia that evening, but neither Tom nor his friends paid it too much mind; they were used to the summer climate of Greece, Italy, Africa, Egypt and Virginia.

"Don't forget my remarks about the common brotherhood and equality of man," said a scholary old gentleman, hitching his robe and fanning himself. "They used to go over big when I was a hot shot on the Athenian Chautauqua circuit."

"Thank you, Zeno," said Tom. "I won't. How is this? We hold these truths to be self-evident, that all men are created equal. . ."

"Wait a minute," Cicero interrupted. "What about equal rights? Your boys won't be worth a hoot if they aren't treated fairly at all times. If I told them once in Rome, I told them a thousand times. All men in a state of nature, I said, have certain equal rights. . ."

"Good," Jefferson nodded, scratching away. ". . . all men are endowed by their Creator with certain inalienable rights; that among these are life, liberty and the pursuit of happiness."

"A little hazy, particularly that last part," said Protagoras, an old Thracian boy. "However, if I were you, I'd throw in something about the origin and function of government. I wrote a constitution for the Thurians one time, and if I do say so myself, it was a dilly."

"True," Tom agreed. "As I recall, it was as sound as it was scholarly. If you don't mind, I'll pinch some of it. Let's see . . . that to secure these rights, governments are instituted among the people, deriving their just powers . . ."

" . . . from the consent of the governed," cut in Saint Augustine. "I was afraid you weren't going to get around to that, Thomas. When I preached in Africa, I used to say that government rested on a general pact of human society to obey law."

"I have no objection to that," said Tom, wetting his quill once more. His voice trailed off, and he hesitated. "But now we come to the $64,000 question: How do we go about breaking the law?"

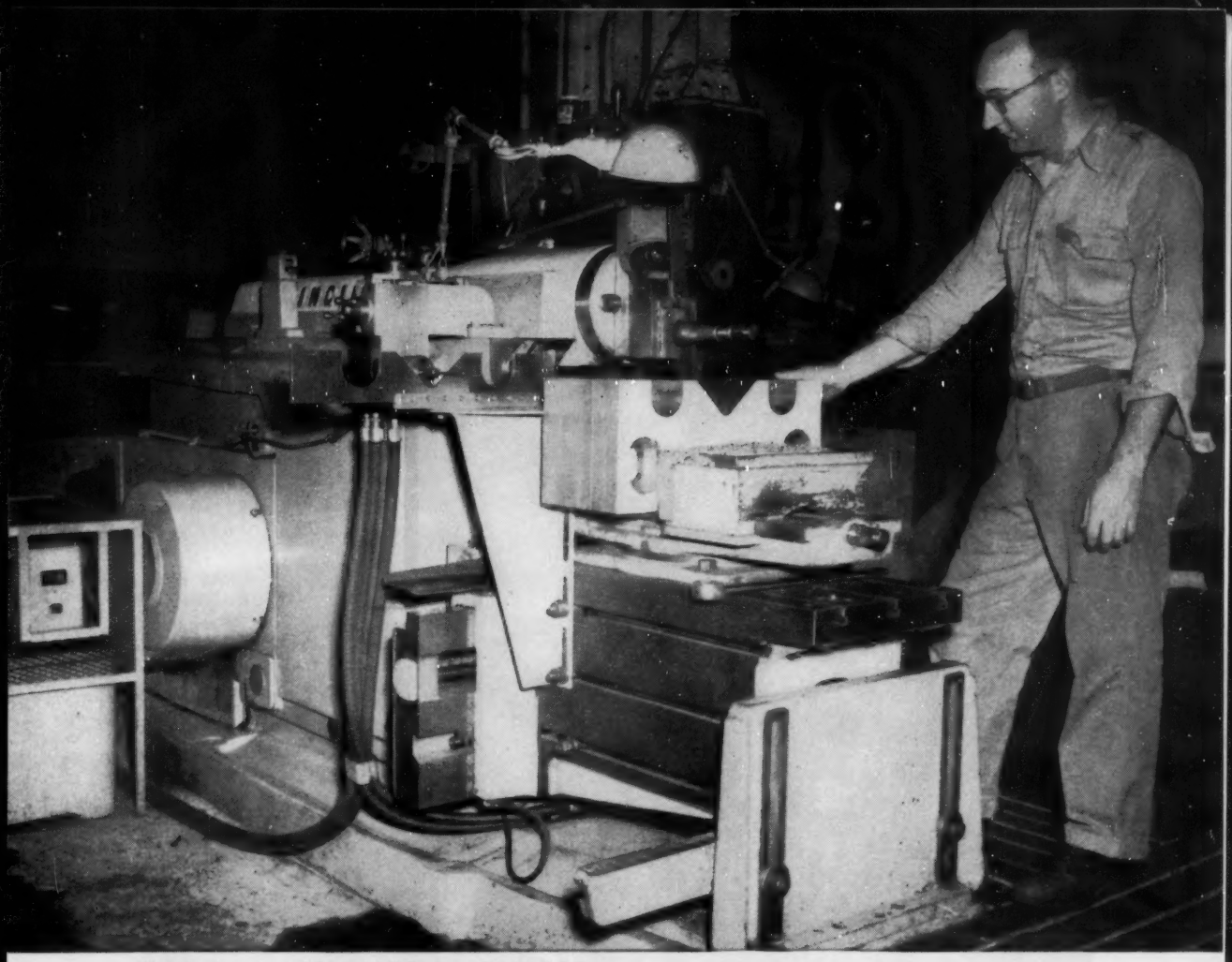
A little man with a flat nose and bugging eyes placed his finger on Jefferson's parchment and shouted: "Resist the mandates of a ruler if those mandates are unjust! Great balls of fire, Tommy, don't just sit on your hands. Write, boy, write!"

"I'm obliged to you, Socrates," said Jefferson. "When any form of government becomes destructive of these ends, it is the right of the people to alter or abolish it . . ."

His busy quill scratched on and on, and his guests, who had given him the wisdom of the centuries, drifted away on the soft evening air. A few weeks later a swaddling nation accepted that document and held it up for the world to see. To endorse it, Jefferson and his friends pledged their lives, their fortunes and their sacred honor. It went into effect 181 years ago next Thursday, and we're glad we reminded you.

Shrdlu

(Metalworking Outlook—Page 27)



Photograph courtesy of Heppenstall Company, Pittsburgh 1, Pa.

High-alloy shear knives machined on accurate Cincinnati Rigid Shaper...

at HEPPENSTALL COMPANY, Pittsburgh 1, Pa.

This Cincinnati 36" Rigid Shaper, equipped with an automatic contouring unit, is machining high-alloy steel shear knives. These knives will be used to cut 3" round-cornered squared billets and 2½" rounds, by a leading Midwestern drop-forge company.

The heavily ribbed column, extended ram bearing and slot-free ram insure minimum deflection and maximum accuracy. Exclusive Cincinnati 50 psi pressure lubrication is real insurance against wear. The Cincinnati electro-magnetic brake and clutch with finger tip control is positive and trouble free. Faster on the job . . . Easier on the operator.

Write Department C for Bulletin "Cincinnati Rigid Shapers". We also suggest you consult our Application Engineering Department regarding your machining problems.

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SHELL CASTINGS

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LESS MACHINING—Close control of dimensions means less machining, faster machining methods, or in some instances elimination of machining altogether.

MADE FOR LIGHT TRAVEL—Less machine stock means reduced weight—lowering transportation costs both in shipment and within the factory.

SUPERIOR SURFACE FINISH—Shell castings have "eye appeal"—their surface dresses up any finished product. Further, a smooth finish reduces wear on machine tools.

AND ONLY 1/16" STOCK IN THE GROOVES, TOO?
YES, AND THIS REDUCES THE WEIGHT FROM 64 TO 46 LBS.
GRAY IRON AND DUCTILE IRON—
Heat treated or as cast
LFC

No matter how huge the finished product, the importance of careful planning for each component part cannot be overemphasized. Savings really did begin at the drafting board stage when heavy road machinery designers specified Lynchburg Foundry shell molding for the sheave pictured above. They reasoned that if certain machining operations could be reduced or eliminated, considerable savings would result.

The use of shell molding in this application meant that finish stock was held to 1/16 inch compared to 1/8 inch or more when other casting methods were used. Further, shell mold cores were used to form the V-belt grooves, thus reducing the machining substantially. An added attraction of shell molding in this case was the fact that the reduced machine stock meant less weight and consequently lower shipping costs from foundry to factory.

Why don't you plan, from the very beginning, to use Lynchburg Foundry shell castings? Savings will be evident from the drafting board, to the assembly line, to the retailer's showroom, and most important, to the man who buys and uses your product.

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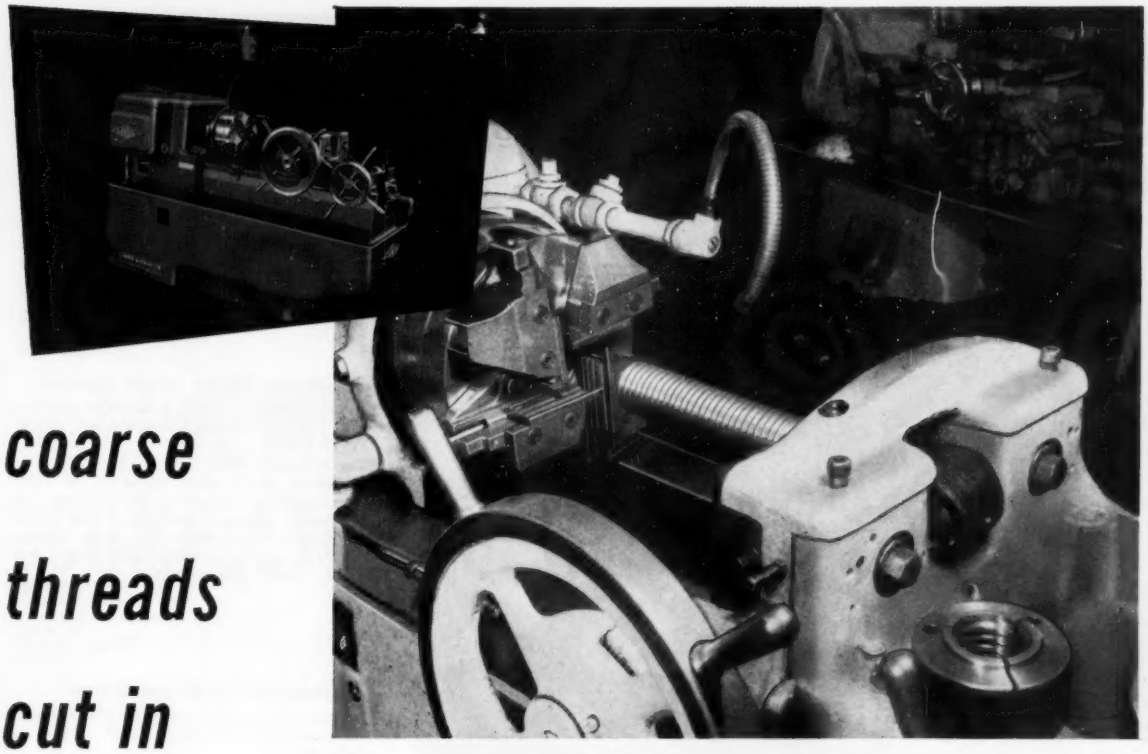


coarse threads cut in one pass with LANDMACO machines

The cutting of large diameter Acme threads at the Iowa Manufacturing Co. of Cedar Rapids, Iowa, illustrates the heavy duty threading possible on LANDMACO Threading Machines.

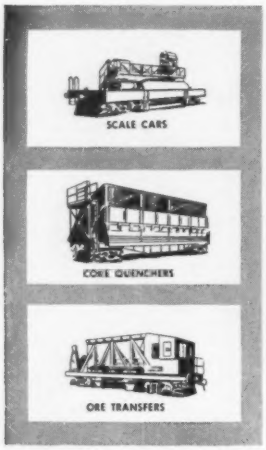
1045 steel forgings of 20-29 Rockwell C are used in the production of adjusting screws for construction equipment. 2¼"–3 pitch Special Acme threads (EXTRA DEEP) are cut 10" long, with a .026 pitch diameter tolerance and a .001 per inch allowable lead error.

Cutting at a speed of 7.6 surface feet per minute, 12.5 pieces are completed per hour. This includes 100% gaging on the machine, using go-and-no-go gages. Despite the large amount of metal removal, at least 80 pieces are produced between chaser grinds.

This job is an excellent example how such heavy-duty threading can be done with the LANDMACO Machine. The 2½" Single Spindle Machine (½" to 2½" range) used here features heavy construction, hardened-and-ground ways, lead screw attachment, and is equipped with a rugged LANCO Tangential Chaser Die Head. Roughing-and-Finishing Centering Throat Chasers produce heavy cuts in one pass of excellent finish, eliminate the out-of-roundness common in long heavy workpieces, and provide low tool cost.

LANDMACO Machines offer precision and heavy duty threading within a range of #4 to 4" in diameter. For more detailed information, please send specifications when writing.

LANDIS *Machine* COMPANY | **WAYNESBORO PENNSYLVANIA**



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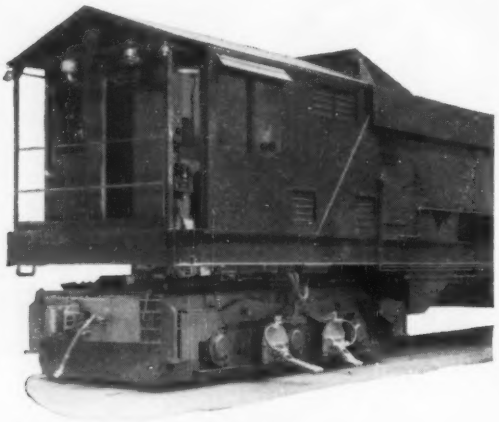

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Each car Atlas builds is engineered to specific task performance . . . and designed for personnel safety.

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CAR & MFG. CO.

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LETTERS TO THE EDITORS

Editorial Interests Reader

I have read your excellent editorial, "A Dangerous Precedent" (June 10, page 97), and would like 75 copies for perusal by our sales staff.

John M. Davidson
Sales Manager
Metal Processing Department
Pennsalt Chemicals Corp.
Philadelphia

Engineers Study Steel Future

Your issue of June 3 contains the report, "Steel Industry Capacities" (page 115).

We would like ten copies. The information is of great value to us. We are studying how the development of the steel industry will affect the need for deeper harbors on the Great Lakes to serve traffic in iron ore, stone and other heavy commodities.

A. R. Striegl
Civil Engineer
Corps of Engineers
U.S. Army
Chicago District
Milwaukee

Information of Great Value

Please forward a copy of the article, "Contouring with Chemicals" (June 3, page 85).

Your magazine contains a vast amount of current information of great value to men working with steel or other metal products.

C. H. Warren
Head-Laboratory Branch
San Francisco Naval Shipyard
San Francisco

Price Hike Hurts Fabricators

In reading about the sluggish steel demand and projected steel price hike, one would think that steel producers . . . would realize we are in a "buyer's market" and that it is impossible for steel fabricators to absorb the continued increases in raw material. Competition—and demand by buyers for lower prices—is creating problems for manufacturers of metal products.

You will remember we had a steel base increase last July; another increase in February of this year of $12 to $13.50 per ton was on extras.

Some of the steel companies have stated that the increase in their first quarter earnings was due to increase in their prices. Some are experiencing a reduced demand for their products. Others are reducing production. What is the answer? More increases in steel prices?

So long as there is a "gentleman's agreement" among prime material producers regarding prices, labor increases,

(Please turn to page 12)

When you surface grind with segments

Take advantage of this COMPLETE Line

. . . and add the profit-boosting "Touch of Gold" to any surface grinder

You can be sure that switching from grinding wheels to Norton abrasive segments brings powerful, profit-building "Touch of Gold" benefits to very many jobs.

Because —

Norton makes segments in every required shape and size and in exactly the right abrasive and bond for best results in the widest variety of surface grinding — on ferrous and non-ferrous metals and on work pieces ranging from boiler plate to the hardest die steels, die sets or blocks.

Norton segments are made in many ALUNDUM* abrasives. Of these, 32 ALUNDUM abrasive is particularly suited for fast stock removal and heavy feeds. 37C CRYSTOLON* abrasive, unequalled on hard cast iron and soft non-ferrous metals, is also available. And diamond segments are also furnished, if desired, for ceramics, quartz and glass.

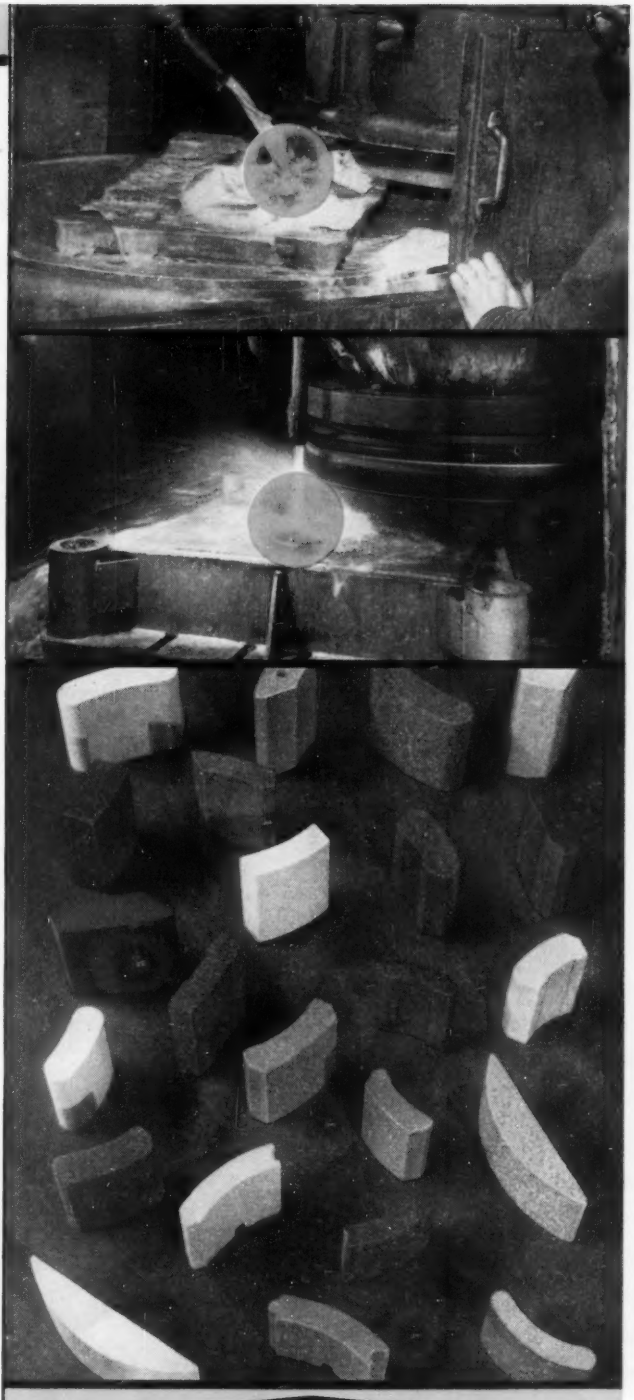
Bonds include the G and BE — both vitrified — as well as resinoid bonds. Structure can be either regular or the open (induced pore) which is especially advantageous for many jobs. In the field of surface grinding, users have reported that the G Bond — most efficient vitrified bond ever developed — results in new speed and economy.

With this broad range of abrasives and bonds to choose from you can count on much faster production rate at considerably lower costs. And when you mount these cost-cutting segments in Norton chucks — designed to fit several machines — you safeguard performance and profits.

Ask Your Norton Distributor for the booklet, "The A.B.C. of Surface Grinding." Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

W-1804



NORTON

ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS

Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING DIVISION

Coated Abrasives • Sharpening Stones • Behr-cat Tapes

YOU GET more* WHEN
YOU BUY BEARINGS
FROM YOUR
Bunting®
DISTRIBUTOR

*more dependability

YOU CAN DEPEND ON BUNTING, the Bunting distributor and on Bunting Stock Bronze Bearings and Bars. The very highest standards of metallurgical and manufacturing processes assure uniform high quality in Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Bearings and Bars. Bunting distributors are the leading responsible distributors in their respective areas. They carry ample stocks at all times.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

Simplified standardized size listing including all ASTM sizes—an exclusive Bunting feature.

Bunting | BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS OF CAST BRONZE AND POWDERED METAL.

The Bunting Brass and Bronze Company • Toledo 1, Ohio • Branches in Principal Cities

LETTERS

(Concluded from page 10)

fringe benefits, pensions, price and increases in price, etc., you will find fabricators and retailers operating on less and less margin.

Labor bosses and producers of basic materials must become realistic with regard to the over-all economic situation. There is a saturation point for fabricators, distributors and retailers.

Anyone looking over the financial reports of fabricators of steel products will find their profits are declining, while the profits of the steel producers are increasing.

We feel the steel companies are entitled to profits, the same as every business or industry. Too, we know it costs more to replace equipment—the same thing applies to fabricators of steel products as well as to steel mills.

Steel companies and labor leaders must recognize the fact that the time is rapidly approaching when they are going to find fewer and fewer customers to pass the increases on to.

L. O. Williams
President
B-W Mfrs. Inc.
Kokomo, Ind.

Bearing Figures of Interest

In the May 13 issue, you had an article, "Good Year for Bearings" (page 74). I noted with interest your estimate of the antifriction bearing market for 1955-1957. How did you arrive at it?

Frank M. Mosier
Research Department
Federal-Mogul-Bower Bearings Inc.
Detroit

• *STEEL asked most of the companies in the industry for an estimate of the market. The published estimate is an average of these guesstimates.*

Review of Labor Trends

We should like to have five reprints of your splendid article, "Labor: Which Way Now?" (June 10, page 99).

A. H. Meyer
President
American Screw Products Co.
Farmington, Mich.

Nondestructive Testing

Your timely article, "Reveals Test Procedures . . . for Atomic Products" (June 10, page 194), is of special interest to us.

We are conducting a study on the suitability and reliability of nondestructive testing techniques to our operations (oil producing and refining).

We would appreciate an extra copy for reference.

W. R. Cooper
Acting Chief Engineer
Arabian American Oil Co.
505 Park Avenue
New York 22, N. Y.

Usership in Action

Your article, "How To Be a Junior Giant" (Apr. 1, page 62), was most interesting and well presented.

We would like to know whether net or gross assets and whether net or gross sales were used, so we may be able to make comparisons with our own company.

N. Douglas MacLeod Jr.
Executive Vice President
Abrasive Machine Tool Co.
East Providence, R. I.

• *Net assets and net sales were used.*

61 models

A machine not put to its best use is theoretically idle. Proper machine selection is an important factor in the profitable use of a multiple spindle automatic. So extensive are the demands on this type of lathe that no single model—or number of models—can be expected to efficiently handle the wide range of work available.

To excel in any range of work a multiple spindle automatic must be specifically designed for that range. That is why CONOMATICS are provided in so many models. In no other way can the purchaser be assured of the best possible machine for his particular requirements.

Write for your copy Today

Conomatic

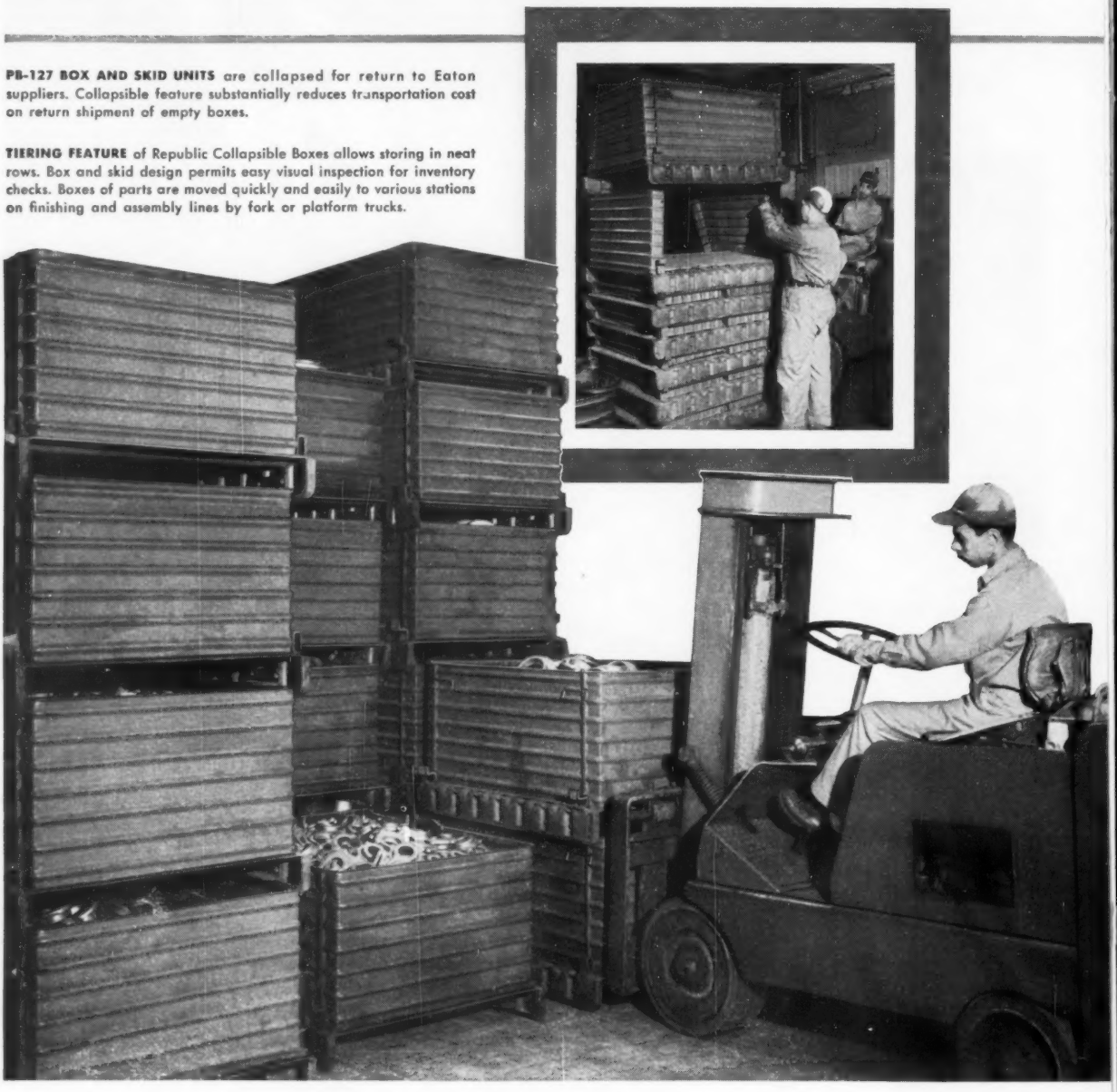
CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

Eaton handles incoming shipments up to 10

REPUBLIC COLLAPSIBLE

PB-127 BOX AND SKID UNITS are collapsed for return to Eaton suppliers. Collapsible feature substantially reduces transportation cost on return shipment of empty boxes.

TIERING FEATURE of Republic Collapsible Boxes allows storing in neat rows. Box and skid design permits easy visual inspection for inventory checks. Boxes of parts are moved quickly and easily to various stations on finishing and assembly lines by fork or platform trucks.



REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

times as fast with BOXES

Prominent truck axle maker saves 7 to 10 man-hours per load. Reduces storage space requirements as much as 66%.

Eaton Manufacturing Company's Axle Division was faced with a costly and time-consuming problem of unloading and sorting a variety of suppliers' parts shipped in bulk form via truck. Unloading and handling time was running as high as 7 to 10 man-hours per truck.

Eaton Axle Division Industrial Engineers, after reviewing several types of boxes, decided on the use of Republic's exclusive PB-127 Collapsible Box and Skid Units. Accessories were specifically engineered to Eaton's requirements.

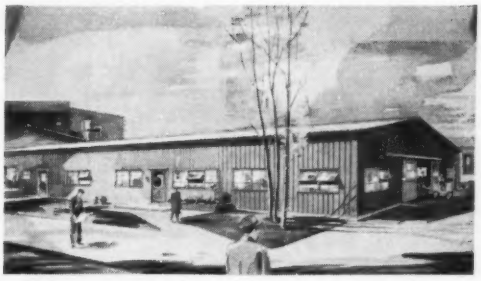
Eaton furnishes its suppliers empty boxes in the collapsed position—the collapsible feature substantially reduces transportation costs on the shipment. The supplier sets up the boxes, fills each with a specific size and type of part and returns them to Eaton. The result? Ten trucks can now be unloaded in the time it formerly took to unload one.

But the saving in time, sorting, and transportation is only part of the story. The PB-127 Collapsible Box is a real space-saver. It's designed to save as much as 66% of the space used by a non-collapsible box. It can be tiered when loaded or empty—collapsed or set up. The PB-127 is built for heavy-duty service. It is a one-piece unit. All parts are permanently attached. A pin and slide bolt arrangement assures positive locking in the set-up position.

Republic Collapsible Steel Boxes are made in a wide range of widths, lengths and heights to meet your requirements. Or if you have a special handling problem, Republic engineers will help you design a unit to fit your plant operation. The coupon will bring you more facts by return mail.

STEEL

and Steel Products



FAST ON-SITE ERECTION with Truscon's new "Budget Buildings". Simplified design brings the cost down low. It's a quality steel building with a tight, dense, galvanized coating that's more rust-resistant than ever. No painting needed. Your "Budget Building" order will be filled fast from off-the-shelf stocks. Immediate delivery in widths of 32, 36, 40, 44 and 48 feet ... 12- and 14-foot heights ... lengths as long as you want them. Send coupon for details.

SIMPLIFY HANDLING, STACKING AND PALLETIZING of bulky, uneven, odd-lot and fragile materials with Republic Steel Pallets and adjustable Pallet Racks. Tubular steel supports on racks adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Mail coupon for specifications and quotations.

REPUBLIC STEEL CORPORATION
DEPT. C-4230
3120 EAST 45th STREET • CLEVELAND 27, OHIO

☐ Send more information on Republic Collapsible Boxes.
☐ Have a Materials Handling Engineer call.
Send me more facts on:
☐ Truscon "Budget Buildings" ☐ Pallet Racks

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Coming July 8

IN

STEEL

Roll Forging Looks for Work

Roll forging is enjoying a rebirth. After hanging around for 100 years or more, it has suddenly become the answer to a production man's prayer for making jet engine compressor blades.

But what about the future? Will roll forging grow in importance or go back to sleep? STEEL thinks it is going to grow. The latest in the Production Ideas series, "Roll Forging Looks for Work" in the July 8 issue, will tell you more about the potential of the process.

STEEL
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from the "Hub" of AMERICAN INDUSTRY

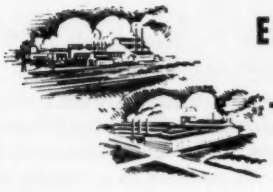
Steel Forgings—Steel Castings . . .

Unbiased design recommendations are yours for the asking

Unbiased design recommendations for the use of steel forgings, steel castings or both result from 85 years experience in their production at Erie Forge & Steel Corporation.

Not only do you have the advantage of this unusual dual production at the geographic hub of America's busiest industrial region . . . you also draw upon our design and engineering experience in specifying steel forgings, castings or combined assemblies for a wide diversity of industrial, maritime, and transportation equipment. Here your steel forgings and castings are produced from raw materials to finished product "Under One Responsibility and One Control." You will profit by consulting with us.

STEEL'S FIRST CENTURY 1857 1957



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ERIE, PENNSYLVANIA

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ERIE FORGE & STEEL CORPORATION

(Advertisement)

What good is specialized business

No one is in a better position to give a hard-boiled, practical answer to this question than the men who spend their working lives on the sales front... the men the ads are supposed to help... the men who sell.

Here are the statements of salesmen who know what advertising does for them when it appears in the industrial, trade or professional publications that serve the specialized markets to which they sell:

William F. Mattes, Jr.
Lamp Division,
General Electric

Sells retailers

Says Mr. Mattes: "My selling is mostly with the headquarters offices of chains—variety stores and food stores. Matter of fact, some of these chains, particularly in the variety store field, do not permit salesmen to call on store managers. They prefer to interview sales people at headquarters, and then send out mimeographed letters to their districts and store managers.

"This makes our trade ads doubly important—they have to take the place of salesmen with the individual store manager or department manager; and they add color and pictures and enthusiasm to the letters that are passed down from headquarters.

"In the old days, the idea of trade paper advertising would simply be to say: 'Stock General Electric lamps, they have the best customer preference.' Today the tendency is to be more specific, to show pictures of the product, illustrations of displays, and pertinent merchandising information. For instance, it is a good merchandising service to be able to tell chain retailers the proportionate popularity of different size bulbs, different colors and types, so that the best merchandising effort is made on the fast selling items. Any facts like these in our trade advertising help the chain store managers and so, of course, make our sales effort that much easier and more productive.

"Trade advertising very definitely helped us introduce and sell packaged light bulbs. Half our unit sales come in bulbs in the 25 to 100 watt range. Knowing this, we put these popular sizes in a handy 4-bulb package. Merchandising bulbs in packages was quite a revolutionary idea when we first introduced them ten years ago, and trade advertising was used to help sell the idea to store managers. Of course, some variety stores still sell loose bulbs, but more and more the trend is toward packaged sales."

Chester Burt
American Hard
Rubber Co.

Sells industry

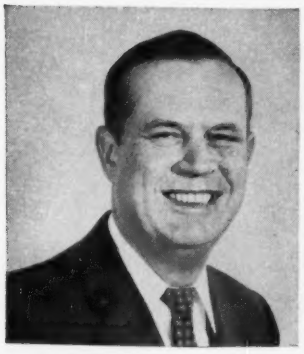
Says Mr. Burt: "After some years as an inside man at American Hard Rubber, I'm taking on my first sales territory and believe me, I'd be worried if I didn't have good leads from our business paper advertising. They give me something to latch on to. With an advertising lead as a start I find there's a better possibility of something coming from a call than if I made a cold call.

"For one thing, even if the man who sent in the inquiry isn't in a very important position in the company, at least the inquiry gets me through the door and once I'm inside I can work it out.

"Another thing I've found is that I can do a better job of planning my trips if I have some advertising leads. More worthwhile calls can be scheduled and it's possible to accumulate leads

publication advertising?

to make a profitable trip to out-of-the-way areas. Of course, on top of all this, I think that in many cases where I've gotten business, trade advertising has reached some of the people inside that I can't see; like people who leave it to others to interview salesmen, but still have to give the final okay themselves."



Robert E. Furer
Mead Johnson & Company

Sells physicians

Says Mr. Furer: "I know that our journal advertising gets a message to the physicians I call on. Here's an example.

"Just the first of this year we adopted the Mead Johnson slogan, '*Symbol of Service in Medicine*'. Last week when working in New Haven, I had three physicians say to me, 'How is the Symbol of Service in Medicine today?'. They did not get the slogan from me. They must have had their thoughts jell from our advertisements in the ethical specialty journals.

"One very important thing is I know our advertising is selling items for me when that item is not on our list of products to push for the current period. For instance, Sustagen is a hot product we have in our line and it's not on our list this quarter. I love the product. It helps people be well fed and stay on the job. But this quarter my instructions are to put major effort on other items. Every time I'm tempted to deviate from the program and go after the big dollar-volume potential of Sustagen sales, I'm reassured that because of our advertising in the journals it is not being forgotten by my doctor friends. Man, this kind of help keeps you on the ball and helps me utilize the three to five minutes of face-to-face selling I have available to me with my doctor friends."

Frank Kistenberger
Metallizing Engineering Co., Inc.

Sells industry

Says Mr. Kistenberger: "I happen to know that better than 50% of my sales to new companies can be traced to leads from our business paper advertising. Another 25% of my sales to new owners I close after following up leads that can't be traced directly to our advertising, but I know darn well that that's where they come from because that's about the only place they could learn about our metallizing systems.

"It's been my experience that our trade advertising is getting to the right people. In many cases this man is an executive who is hard to see on a cold call. But he's a guy that will take the time and trouble to read and he's just the one to drum up interest in metallizing down the line in his company. In other words, you get more action if the suggestion comes down to the production department or the plant engineer from this executive."

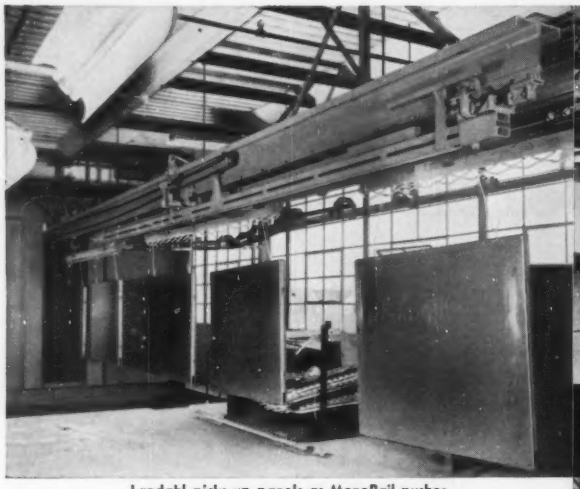
Why not ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

National Business Publications, Inc.

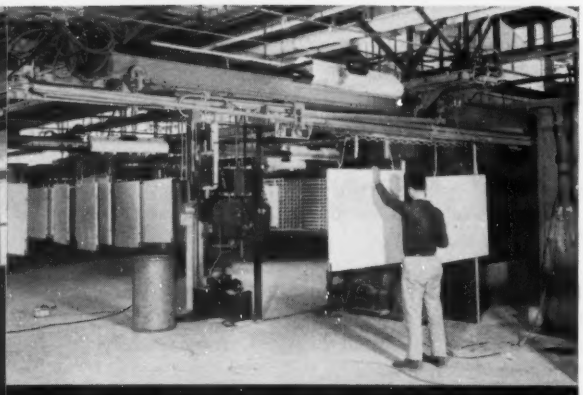
NBP

...each of which serves a specialized market in a specific industry, trade or profession.

1413 K Street, N.W., Washington 5, D. C. • STerling 3-7535

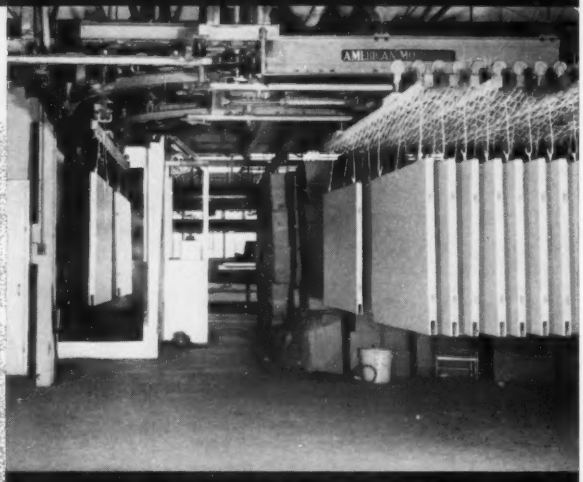


Landahl picks up panels as MonoRail pushes them from degreasing.



MonoRail pneumatically pushes a "car" of panels into a finish spray booth.

Automatic Finishing with Power LANDAHL and AMERICAN MONORAIL



Finished panels are pushed by MonoRail from the bake oven.

Space was saved and automatic finishing achieved by combining two overhead handling systems.

American MonoRail cars carrying metal panels move through degreasing, priming, finishing and baking. In each operation either loading or unloading is performed automatically by power — the Landahl Chainless Conveyor acting as a "pusher" over most of the system.

Here is "team work" engineering to take advantage of the flexibility of both American MonoRail and Landahl Chainless Conveyors.

This efficient system is installed at Fostoria, Mfg. Co., Fostoria, Ohio, for finishing metal panels for office partitions.

For details on how American MonoRail or Landahl Conveyors can cut your handling costs, write today.

Member of The Materials Handling Institute, Inc. & MonoRail Manufacturers' Association.

For Power Driven Conveyors, Use Landahl Chainless Conveyors

AMERICAN
MONORAIL
COMPANY

13102 ATHENS AVENUE, CLEVELAND 7, OHIO (IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

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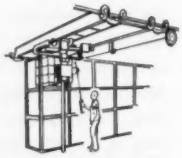
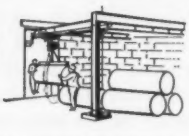
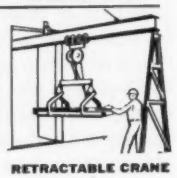


STACKER CRANE

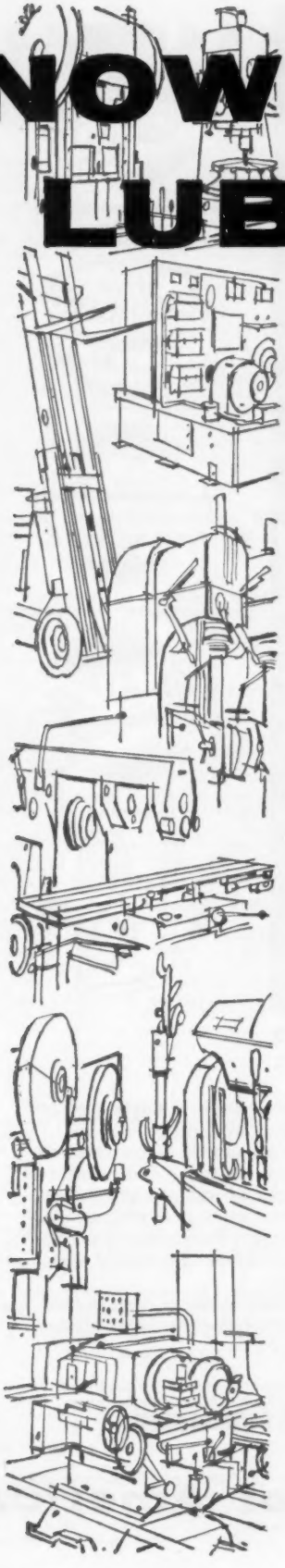


MANUAL MONORAIL



RETRACTABLE CRANE

NOW! ATLANTIC LUBRICANT 54



...the one lubricant for practically every industrial need

New Atlantic Lubricant 54 is industry's closest approach to the universal grease lubricant. The use of this distinctively purple grease in your plant practically assures the correct choice in any application. It has given outstanding performance in all types of machinery.

Every shop, large or small, can make economical use of Atlantic Lubricant 54 because it gives

- ...multiplicity of use—reduces chance for error, cost of warehousing, and handling
- ...outstanding rust protection—protects ferrous surfaces under wet conditions
- ...excellent lubrication performance from very low to extremely high temperatures
- ...unusual stability against oxidation and softening under rugged working conditions
- ...positive identification due to its purple color

This product is available from warehouses conveniently located throughout Atlantic's marketing territory and may be ordered through the nearest office listed below.

ATLANTIC

LUBRICANTS • WAXES
PROCESS PRODUCTS

PHILADELPHIA, PA.
260 So. Broad St.

SYRACUSE, N. Y.
Salina and Genesee Streets

PITTSBURGH, PA.
Chamber of Commerce Building

READING, PA.
First and Penn Avenues

PROVIDENCE, R. I.
430 Hospital Trust Building

CHARLOTTE, N. C.
1112 South Boulevard

free-machining

MAX-EL 3½ ALLOY STEEL

gives parts like these high strength, toughness

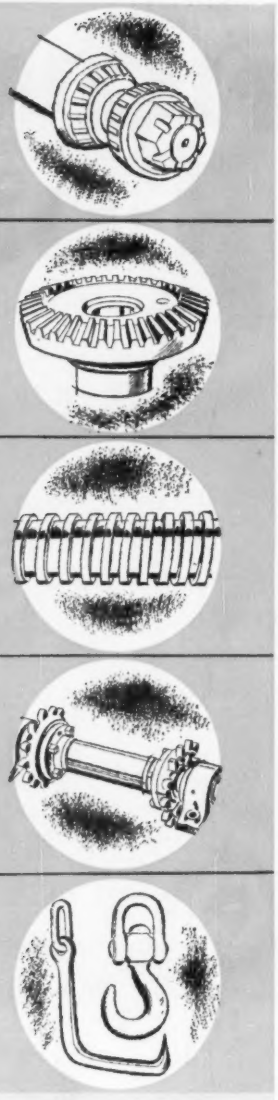
AXLES

GEARS

JACK LIFTING SCREWS

SHAFTS

HANDLING TOOLS



...AND YOU CAN MACHINE EVEN INTRICATE PARTS FROM HEAT-TREATED AND STRESS-RELIEVED BARS

Max-el 3½ is the ideal general-purpose steel for mining and construction shops. It has all the properties needed for rugged applications: toughness, strength, resistance to wear and impact. More than that, you can buy it from your nearby Crucible warehouse in heat-treated and stress-relieved bars — in the diameters and lengths you need — which do not require final heat treatment after machining.

Factors like these enable you to speed up repairs whether you make them in the field or in the shop. As a result, you cut down-time and repair costs — get your equipment back on the line faster. Then, too, parts made of Max-el 3½ last longer even on jobs where they're in continual rugged service.

Because of Crucible's methods of manufacturing and quality control, Max-el 3½ is made in extremely accurate sections and straighter bars, in a complete range of sizes and shapes. All Crucible warehouses carry complete stocks so that, in many cases, you get 24-hour delivery of whatever quantity you need.

Like more information? Write: *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

CALENDAR
OF MEETINGS

July 6-9, Automotive Engine Rebuilders Association: Summer meeting, Royal York hotel, Toronto, Ont. Association's address: 419 N. Capitol Ave., Indianapolis 4, Ind. Executive vice president: R. G. Patterson.

July 16-17, Truck-Trailer Manufacturers Association: Summer meeting, Homestead, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Secretary: John B. Hulse.

July 24-27, National Tool & Die Manufacturers Association: Summer meeting, Grove Park Inn, Asheville, N. C. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Aug. 12-15, Society of Automotive Engineers: West coast meeting, Olympic hotel, Seattle. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N.J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 18-20 National Industrial Conference Board: Marketing meeting, Waldorf-Astoria hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Do you need better ways to strip paint?

When tough finishes resist your present stripping methods, you may need help on some of these problems:

1 How to strip oil-base paints . . . synthetic enamels . . . alkali-resistant plastics . . . resin-base paints . . . japans . . . wrinkle finishes . . . nitrocellulose lacquers . . . alkyds . . . phenolics . . . ureas.

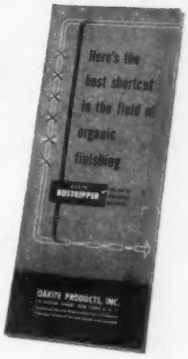
2 How to strip zinc chromate primers without etching aluminum.

3 How to strip paint from vertical surfaces and undersurfaces where thin-bodied strippers run off without doing their work.

4 How to strip metal parts that are too large to be soaked in tanks.

5 How to strip paint, pigment residues, phosphate coatings and rust in one operation.

6 How to strip paint from rejects, conveyor chains, racks and hooks in continuous operation.



Oakite has more than a dozen fine stripping materials for these and similar jobs.

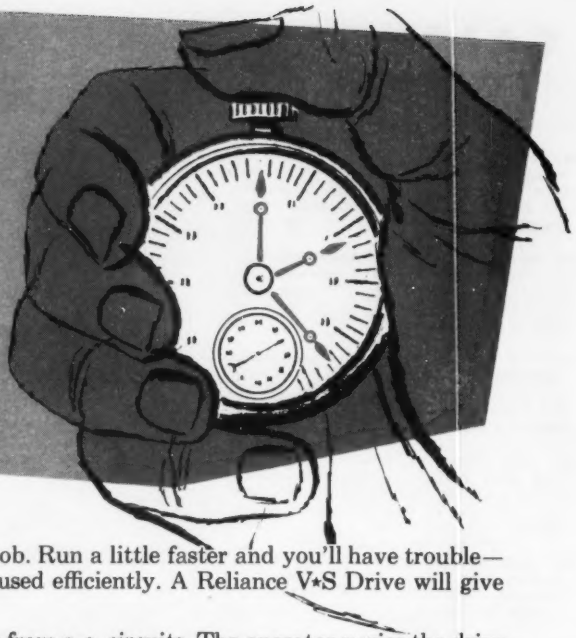
FREE For information on problems 1, 2, 3 and 4 ask for a copy of "How to STRIP PAINT". For more on problems 5 and 6 ask for "Here's the best shortcut in the field of organic finishing". Write to Oakite Products, Inc., 34E Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE®
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

how do you measure your production?



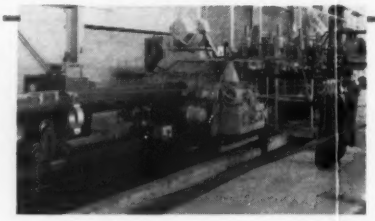
There is a *just-right* production speed for every job. Run a little faster and you'll have trouble—a little slower and your equipment is not being used efficiently. A Reliance V*S Drive will give you the *just-right* speed for each job.

Reliance V*S is an all-electric drive that operates from a-c. circuits. The operator varies the drive motor rpm. to set up the ideal speed for every job. With no rigid set of gear ratios with a limiting number of speeds, he has an infinite selection of rpm.'s from a wide flexible band of operating speeds.

There is a V*S Drive designed for your equipment. Write for Bulletin D-2311.

• TONS PER HOUR—

In order to maintain a uniform production rate of 80 tons per hour with varying sizes of pipe, this pipe mill must change its line speed from 30 ft. per minute to 80 ft. per minute to compensate for differing gauges of steel. A 500 hp. multi-motor V*S Drive does the job.

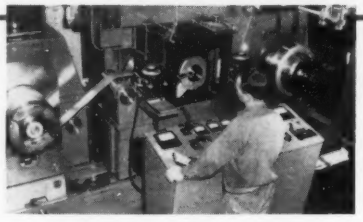


• YARDS PER MINUTE—

In order to properly size differing types of cotton cloth, the textile slasher must operate at line speeds varying from 28 yds. per minute to 225 yds. per minute. A 25 hp. V*S Drive does the job.

• REVOLUTIONS PER MINUTE—

In order to maintain the correct tension on the metal on this highly accurate rolling mill, the speed of the coil winder must decrease from 900 rpm. to 450 rpm. as the diameter of the roll builds up. A 20 hp. V*S Drive does the job, automatically. D-1563



RELIANCE ELECTRIC AND ENGINEERING CO.

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"WHAT'S YOUR LINE?"

CHEMICALS, PRIMARY METALS, MACHINERY?

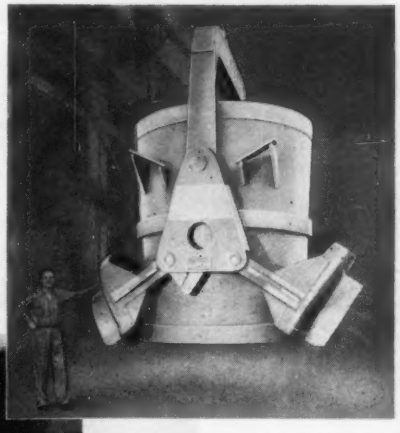
Special indexing machine tool base over ten feet in diameter, weight nearly ten tons.

You name it—and the odds are two to one that McGregor-Michigan is experienced in *your* line. We're turning out an endless miscellany of steel plate fabrications for industries across the nation. As part of the proof of our ability and versatility, here are a few of the products of the manufacturers and processors we're serving:

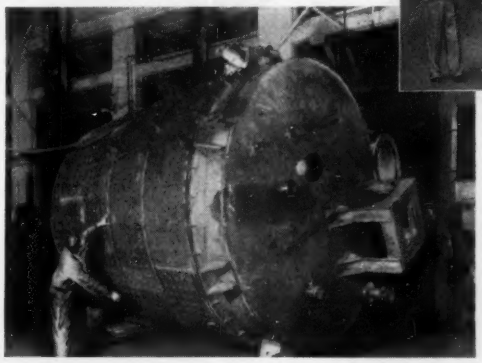
> Acids, alkalis, fertilizers, glass, refractories, plastics, petroleum, steel, aluminum, automation and special machinery, explosives, paper, diesels, cement and rock products, coke by-products, leather, soap, tools and dies, textiles—and numerous variations of these.

As further evidence of the reliability of McGregor-Michigan, we're proud to point out that the frequent repeat orders from these fine customers are the surest indication that we've earned their good will. How? By seeing that all factors are in balance: price, quality, delivery and service—for it is only by complete attention to *all* of these that we are able to fully satisfy our many diversified customers.

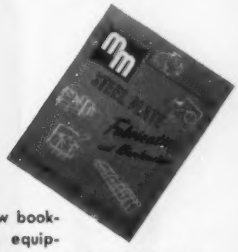
If you don't see your particular industry included in the list above, think of the many problems these customers have thrown at McGregor-Michigan —then go and do thou likewise.



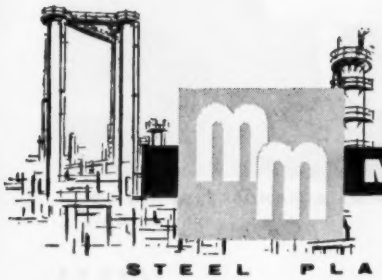
Steel mill scrap bucket. Linkage equalizes opening of clamshell halves.



Stainless steel jacketed chemical mixing kettle. Operates under vacuum and atmospheric pressure, medium high temperatures.



Send for new booklet showing equipment and typical steel plate fabrications.



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STEEL PLATE FABRICATING AND WAREHOUSING

OUTLOOK MET
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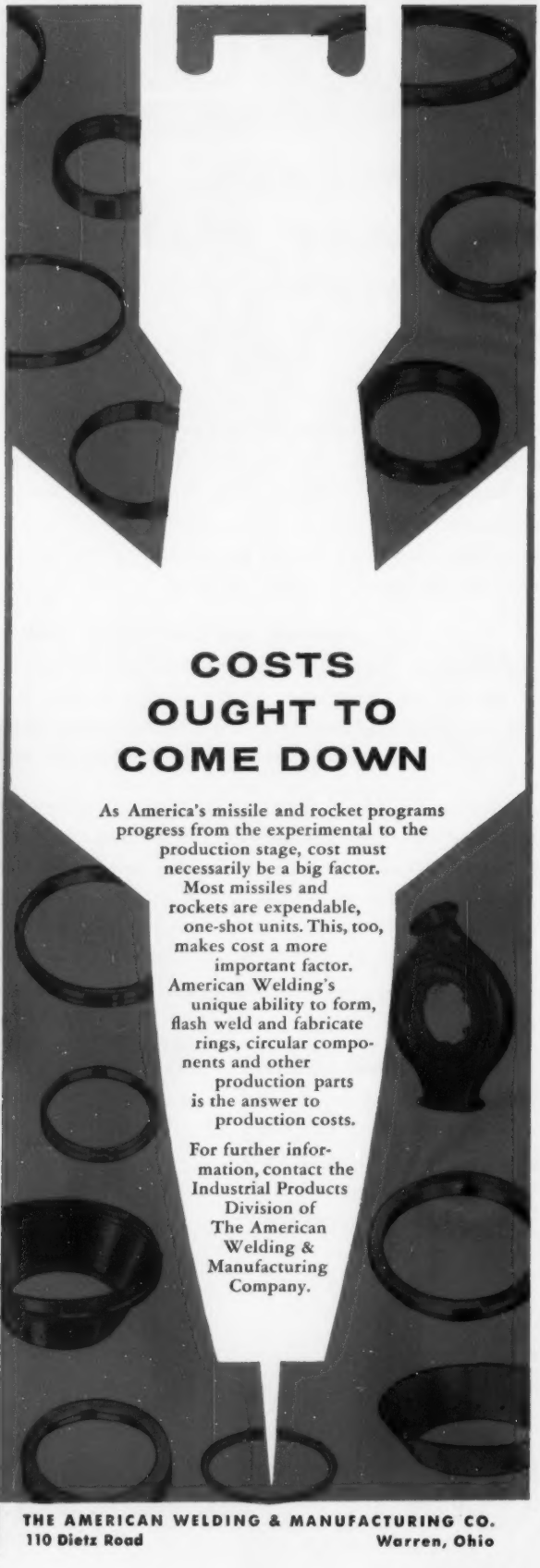


COSTS OUGHT TO COME DOWN

As America's missile and rocket programs progress from the experimental to the production stage, cost must necessarily be a big factor. Most missiles and rockets are expendable, one-shot units. This, too, makes cost a more important factor. American Welding's unique ability to form, flash weld and fabricate rings, circular components and other production parts is the answer to production costs.

For further information, contact the Industrial Products Division of The American Welding & Manufacturing Company.

THE AMERICAN WELDING & MANUFACTURING CO.
110 Dietz Road **Warren, Ohio**

Metalworking Outlook

End of Engineers' Shortage?

The engineering shortage may have run its course, at least in the aircraft industry in southern California (see page 38). One major aircraft manufacturer is reported ready to lop 1800 off its payroll. The industry's recruiting now is limited to top engineers. Sensing the situation, at least one nonaircraft firm, Chrysler Corp., is advertising for engineers in the Los Angeles area.

For the 30-Hour Week

Aluminum Workers International Union (AFL-CIO) has come out for the 30-hour week in 1958. It joins the ranks of the United Auto Workers and International Association of Machinists, the other big metalworking unions that will seek the short week next year. At its convention, the AWIU voted against merging with the United Steelworkers, a union which represents more primary aluminum employees than does AWIU.

Linde Workers Back on Job

The long strike at Union Carbide Corp.'s Linde Co. division has been settled. A two-year contract with a one-year wage reopener ended the walkout at Kittanning, Pa., by the Oil, Chemical & Atomic Workers. Hourly wage hikes range from 12 to 15 cents. That ends all but one disagreement at five Linde plants. Still up in the air is the no-contract situation at Linde's Youngstown facilities where employees are working, pending a National Labor Relations Board ruling on a petition for a decertification election.

Gentle Price Rise To Continue

Watch for a continuing rise in the consumer price index over the rest of the year. It hit 119.6 per cent of the 1947-1949 average in May. That's up 0.3 per cent from April and 3.6 per cent from May, 1956. It's a record and the ninth straight month of climbing. About 750,000 workers in steel, mining, aluminum, metal containers and fabricating will get a 4-cent an hour pay boost as a result. Real take-home pay for the average factory worker with three dependents dropped 17 cents in May to $74.47 a week.

Trouble in Titanium

The military market for titanium is slipping. More than half of present production goes into Pratt & Whitney's J-57 jet engine—and the jet engine's military future is clouded as a result of the shift to missiles. Consumption of titanium mill products this year may slide to 16 million-17 million lb, down markedly from earlier estimates of 20 million to 23 million lb. Even so, the gain over 1956 will be more than 10 million lb. But the

1958 target of 30 million lb for mill product use appears out of reach. Says one producer: "We will be able to develop greater civilian uses, but it may take time."

Kaiser Steel Widens Plate Mill

Kaiser Steel Corp. will widen its plate mill at Fontana, Calif., to 148 in. to make 42-in. oil line pipe at its Napa, Calif., fabricating plant. As part of its $194-million expansion program at Fontana, Kaiser had planned to convert its 110-in. plate mill to 144 in. The decision to widen it came because oil companies now want the superpipelines, especially in the Middle East.

The Steel Merger Case

Government lawyers think the Supreme Court's Du Pont decision will strongly influence the ruling on the Bethlehem-Youngstown merger case. Judge Edward Weinfeld hears the matter in the New York federal court and will probably give his decision by next December. "The Du Pont ruling offers guideposts for action by lower courts," says one Washington lawyer.

Capital Outlays To Stay High?

American industry plans to invest $150 billion in new plant facilities and equipment during the next four years. So says Willard C. Asbury, vice president for Esso Research & Engineering Co., who adds: "Historians will look back on the period immediately following World War II as the beginning of the third industrial revolution." Mr. Asbury's forecast envisions spending at an annual rate of $37.5 billion for the next four years. Spending last year was $35.1 billion, but it should reach $37.4 billion in 1957.

Selecting the Bosses

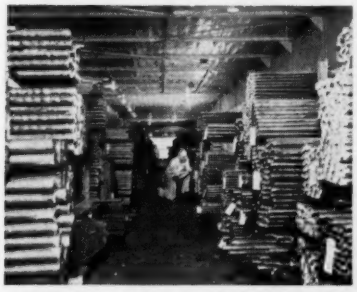
Few companies have adopted a systematic approach to select tomorrow's executives, says the National Industrial Conference Board. In 62 companies surveyed, 55 per cent of management posts were filled on the basis of merit, outnumbering all other methods of selection combined. The automatic method ranks next highest, where management waits for able men to come to the top naturally. Ten per cent of the companies listed pirating as a means to fill executive needs. Compromise (the least likely candidate is appointed) was checked by 5 per cent of the companies. Another 5 per cent scored miscellaneous methods involving nepotism, seniority and politics.

Straws in the Wind

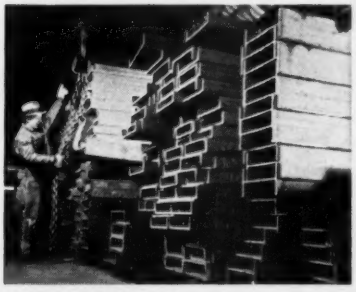
Two California counties have passed ordinances against compulsory unionism . . . An Ohio ruling permits workers to collect public and private unemployment benefits if they're not paid concurrently, but legal clarification is still needed . . . The U.S. has eased export restrictions on aluminum scrap, remelt ingots and certain selenium materials, but licenses will still be required . . . This fall, look for a major company to introduce an inert gas, bare wire electrode for the joining of dissimilar materials.

REPORT FROM RYERSON
on Services and Products in Stock

In addition to the products shown below, you can call on Ryerson for flame-cut steel shapes, fabricated steel for reinforced concrete or steel frame construction—many other products and services. And equally important are the specialists who carry out the Ryerson quality control program —see that customers specifications are *exactly* met, that every order is correctly filled and promptly delivered. As a result you get unequalled service and certified quality when your company calls Ryerson for steel, aluminum, industrial plastics and machinery.

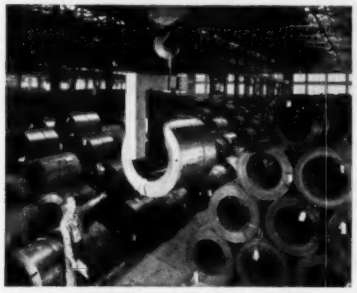


CARBON STEEL & ALLOY BARS
Most complete range of types, shapes and sizes as well as largest tonnage.

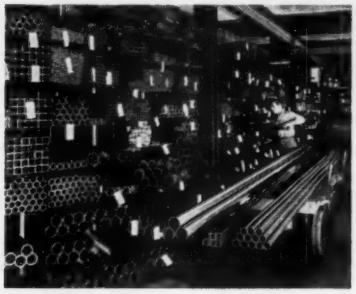


STRUCTURALS—I-beams, H-beams, channels, angles, tees and zees—all high quality steel to ASTM spec. A-7.

PLATES—14 types including special low carbon steel plates for forming and welding, leaded New E-Z-Cut, etc.



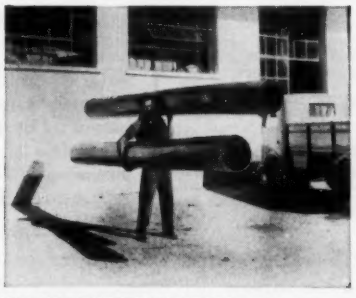
SHEET STEEL & STRIP—More than 20 different types in pattern sizes, cut-to-order sizes, strip coils, etc.



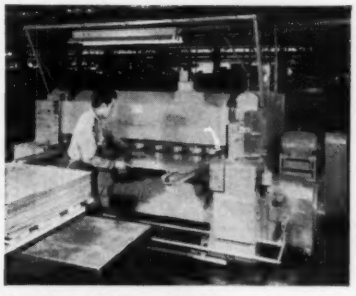
TUBING—Seamless and welded steel tubing—mechanical tubing, fluid line, pump cylinder and structural tubing.

STAINLESS STEEL—Allegheny stainless in over 2,221 sizes, shapes, types, finishes: sheets, plates, bars, pipe, etc.

ALUMINUM—At many Ryerson plants —sheets, coils, plates, bars, tubing, architectural and structural shapes, etc.



INDUSTRIAL PLASTICS—PVC pipe, fittings, sheets and rods, rigid Kralastic and flexible polyethylene pipe.



MACHINERY & TOOLS—The broadest line of metal-working equipment available from a single source.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

ROAD PAVER AT WORK ON RECENTLY COMPLETED DETROIT-TOLEDO EXPRESSWAY. DSC PHOTO

DSC Electro-Welded Wire Fabric Makes Concrete Crack Resistant

WHAT IT IS—DSC Fabric is a money-saving means of supplying the needed tensile strength which concrete commonly lacks. That explains its engineering function in the building of roads and structures and in fabricating concrete pipe and other precast concrete products.

Portsmouth mesh consists of DSC Bright Basic L. C. Reinforcing Wire. The wire intersections are electrically welded to produce a continuous lattice-work mat.

DSC Fabric conforms to ASTM Specification A-185-56T—PROOF of PERFORMANCE of DSC STEEL . . . on the job.

HOW IT SERVES THE PUBLIC—DSC Fabric promotes easier, smoother, faster and *safer* highway driving; saves tax money by reducing initial and maintenance costs of public roads, structures, sewerage and general drainage systems; protects buildings against cracks, leaks, vermin.

For more information on DSC Fabric and its uses . . . or about other DSC Rod and Wire Products . . . or DSC Sheet and Strip Steel—please write DSC General Sales Office or call your nearest DSC Customer "Rep" . . . today?

Customer Satisfaction Is Our Business

DSC MILLS AND PRODUCTS

PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon
Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand
Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DETROIT DSC STEEL

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DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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No Cause for Gloom

In talking with men in industry across the nation the last two weeks we were struck by the apprehension many of them expressed. Their fears for the future are based on the conflicting elements that are tugging and pulling at our economy.

We heard talk about more inflation, sparked by the steel price increase, by higher wage costs and by the ninth consecutive rise in the consumer price index in May.

We heard talk about deflation, the result of tight money, a cut in arms production and a possible buyers' strike.

We heard talk about shrinking profits, labor shortages and cutbacks in industrial ordering.

At the bottom of their anxiety is a question: Is our prosperity a paradox?

Let's take a look at the over-all picture: Production of goods and services (gross national product) will establish a new high of $430 billion this year. STEEL's midyear survey of 5000 metalworking management people (page 33) verifies earlier expectations that the metalworking industry as a whole will have its best year ever. The chances for another record in steel production are excellent.

We agree that our prosperity is not being dispensed uniformly. But we wonder if some of our headaches aren't blessings in disguise.

Labor, which is in short supply, is flexing its muscles with newly acquired power, contributing automatically to higher costs and price inflation. Its persistent demands are making it necessary for industry to adopt more efficient production equipment, seek out new methods and more closely control production scheduling to reduce multishift operations.

Tight money has prompted many a company to keep a more vigilant eye on its accounts receivable, to wipe out obsolete inventories, to eliminate deadwood among its personnel and to take a fresh look at selling prices in relation to costs.

The switch in arms requirements has forced long delayed diversification into consumer products and actually has made for a surplus of engineers in some areas.

The basic problem, as we see it, is learning how to live in a sound but expanding economy. We must become accustomed to adjustments and never lose sight of the over-all picture.

Certainly, there is no cause for gloom. The competitive forces of a free economy have never been more freely at work.

Irwin H. Such

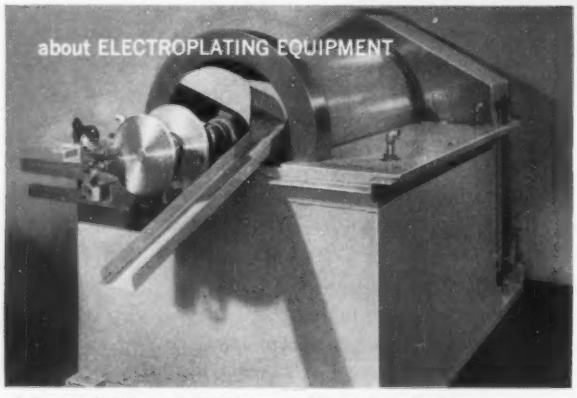
EDITOR-IN-CHIEF

from: Metal & Thermit
to: The IDEA Minded

Welding problem solved—production increased

The Blaw-Knox Company, a leading designer and constructor of high pressure, high temperature catalytic reformers for petroleum refining uses special chrome-moly pipe to resist hydrogen attack on furnace tubes at high temperature and to provide desirable creep properties. Welding this alloy had always been difficult. Yet maximum assurance against weld-failure was essential.

Chosen for this difficult job, M&T's Murex® CROLOY electrodes make it easier to obtain high quality welds because maintenance of preheat and postheat temperatures is not critical. These Metal & Thermit electrodes, combined with Blaw-Knox designed unique welding back up equipment, increased productivity of the Blaw-Knox welding crew by a full 50%. They improved weld penetration, eliminated underbead cracking.



A barrel of savings in small parts plating

Chromium plating of small parts is no longer a costly, manhour consuming operation. The unit shown is the new *continuous* Unichrome chromium plating barrel designed by Metal & Thermit. This is a real production tool. It equals 4 batch type barrels in output; plates up to 200 pounds of parts per hour. It brings automation to companies that must chromium plate hundreds of thousands of small parts per day.

Golden-glow bronze finish wins the trophies

Arlen Trophy Company, leading manufacturer of die cast trophies, finds "gold" in the M&T *Golden-Glow* Bronze Plating Process. Cups formerly plated with copper, nickel and gold now get a beautiful-to-behold bronze finish directly on castings. It is the image of 24 kt. gold!

M&T Bronze is also being used in hundreds of installations to replace copper as an undercoat, plating intricate parts more uniformly and twice as fast. It also helps conserve costly nickel.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
CERAMIC MATERIALS
WELDING SUPPLIES
METALS & ALLOYS
HEAVY MELTING SCRAP

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY
Pittsburgh • Atlanta • Detroit • East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

$138 Billion Year

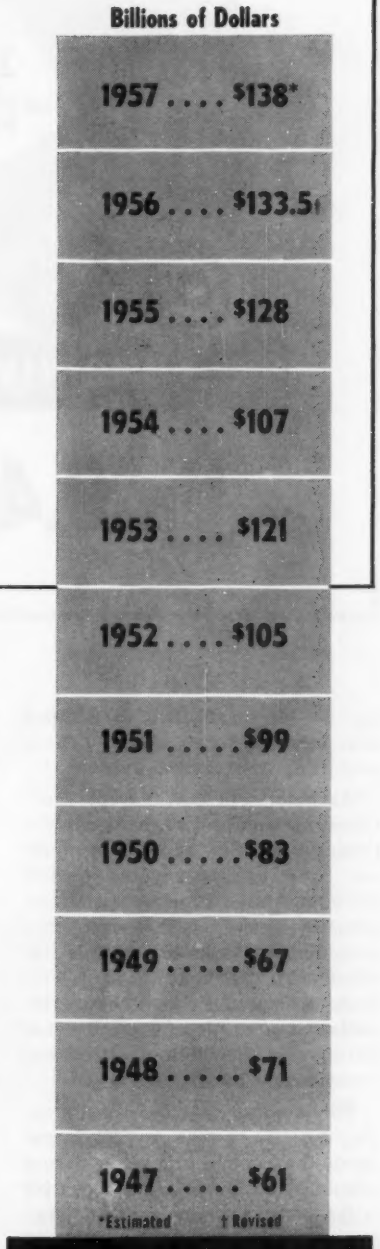
METALWORKING MANAGEMENT EXPECTS:

3.8% Gain in Last Half of 1957

47.3% Expect Increase
21.4% Expect Decrease
31.3% Expect No Change

3.2% Gain in 1957 over 1956

53.8% Expect Increase
28.8% Expect Decrease
17.4% Expect No Change



Metalworking sales volume will continue to rise during next six months. But profits will be squeezed by higher wage-material costs and competitive pricing

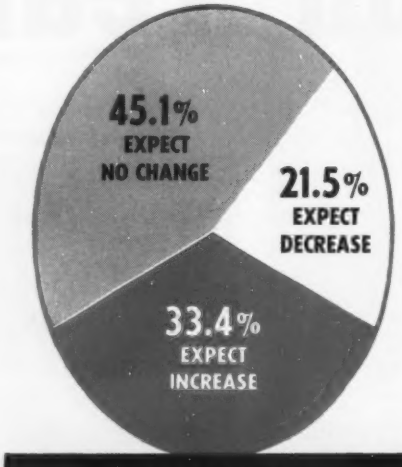
METALWORKING'S boom has eased up, but it hasn't topped out. Sales volume in the second half will be higher than it was in the first half this year and the second half last year. Dollar volume this year will be comfortably ahead of what it was in 1956.

That is the consensus of metalworking managers taking part in STEEL's Midyear Survey of Business Expectations. The editors of this magazine queried more than 5000 general managers of metalworking plants to find out what they expect in production, sales, employment, prices, costs, expansion and profits at their plants.

On Upgrade—Four of five think the second half will be as good as or better than the first. Two of three expect the second half to be as good as or better than the second half of 1956. Seven of ten predict that their dollar volume in 1957 will be as large as or larger than it was in record 1956.

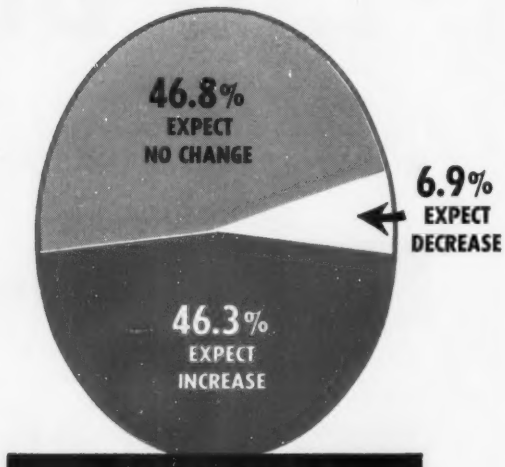
Especially bullish are the manufacturers of electrical machinery and equipment, fabricated metal products, and instruments and scientific apparatus. They are count-

The Swing is Upward in the



EMPLOYMENT

Up 0.4%



SELLING PRICES

Up 1.7%

ing on increases of 7 to 9.5 per cent in second half dollar volume over that for the first half.

Machinery people, except electrical, anticipate a slight downturn because backlogs of some producers have been dissipated during the first half. The transportation industry, heavily influenced by the auto makers, looks for a slight improvement. Primary metals industries expect a dollar volume increase as a result of higher prices during the second half. Physical volume may be slightly lower.

Medium-size plants—those employing 100 to 500—expect larger gains than do the smaller or larger plants. The middle group looks for a 6.4 per cent gain in second half volume, compared with an over-all expectation of 3.8 per cent.

Unit Output Gaining—Increases in physical output and slightly higher prices will exert about a 50/50 influence on dollar volume gains.

SKILLED WORKERS

11.6%
EXPECT
SOME SHORTAGE

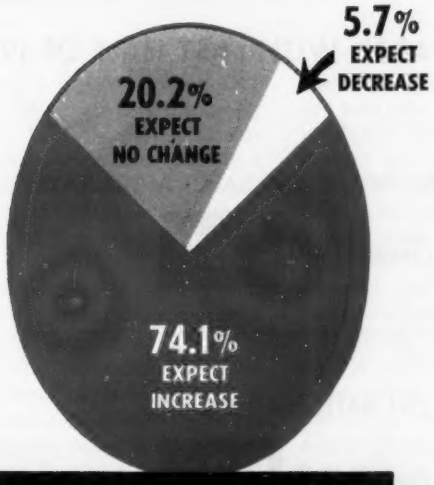
Employment Steady

Metalworking employment will gain only slightly during the second half. One of three plants expects to add employees. One in five will employ fewer people, and nearly half see no change.

Net result: A gain of 0.4 per cent in metalworking employment.

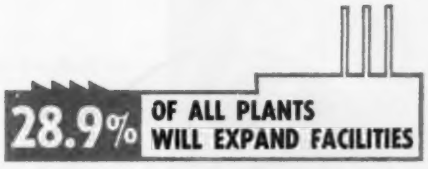
The electrical machinery and equipment industry will offer the most opportunities for job seekers. They expect to expand employment by 6.3 per cent. Fabricated metal products, instruments, ordnance, furniture and fixture and the miscellaneous industries plan for

Second Half vs. First Half, 1957



MANUFACTURING COSTS

Up 3.7%



4.4% will build new plants

13.2% will add to present plant

22.1% will install new equipment

CAPACITY

Up 4.5%

smaller gains. The primary metals plants, machinery and transportation establishments look for slight decreases.

Labor Supply Better—The shortage of skilled labor is reported to be less of a problem than it has been for several years. Only 11.6 per cent of the reporting plants expect output will be curtailed by such a scarcity. Comparison: At the beginning of the year, nearly one-third of all responding plants put themselves in that category.

In fact, respondents to the midyear survey indicate less concern over labor problems generally than they have in any recent survey. Complaints about work stoppages are negligible. Productivity appears to be fairly normal.

Wages Up—The relative labor peace is, of course, bought at a price. Most plants find their wage costs going up because of automatic wage increases or annual improvement factors. They lead to many complaints that wage costs are gaining much faster than productivity.

Costs Outrun Prices

Three of four metalworking plant managers expect unit manufacturing costs to go up during the second half. Only 1 in 20 believes costs can be lowered.

Primarily, heavier costs will result from higher wage rates which will become effective in many plants around midyear. In many cases, the increases are automatic and are provided for in the long term contracts. They, in turn, will influence increases which will be granted to other workers.

Secondarily, costs will be upped by stiffer prices on materials purchased. Hundreds of plant managers are anticipating higher steel costs.

Hesitate on Prices — Selling prices will be marked up substantially less than costs. Nearly half the reporting plants expect to hold prices where they are. Some hope to lower them, as a result of improved manufacturing efficiency. A few will cut prices to meet competition and let profits go hang.

Growth Continues

Metalworking capacity is expanding at about the same high rate it has for the last several years.

New facilities will be brought in-

. . . but Profits Will Drop 8%

COMPARED WITH LAST HALF OF 1956

EXPECTED PROFIT ON SALES AFTER TAXES

1957 (Second Half) **4.6%**

PROFIT ON SALES AFTER TAXES

1956 (Second Half) **5.0%**

to production during the second half by 28.9 per cent of the responding companies. They will build up their capacity by 15.9 per cent. That indicates a 4.5 per cent increase in over-all metalworking capacity.

Of those expanding, 4.4 per cent are putting up new plants; 17.9 per cent are adding to what they have; and 22.1 per cent are beefing up capacity by installing modern, more efficient machinery and equipment.

Spend To Pare Costs—Capacity is more than adequate to meet current demand for most metalworking products. Often the question is raised: "Why is the industry continuing to expand?" Responding companies give two reasons: 1. Wage and material costs are putting such a squeeze on profits that it is necessary to use the most efficient production equipment possible to keep costs down and remain in a competitive price position. 2. Demand will surge upward in the early 1960s, with a wave of new family formations. It is necessary to build new plants now to have facilities in place when the new demand arrives.

Profits Slide

Overshadowing the optimistic side of the picture is the concern of metalworking managers over shrinking earnings. Their comments definitely point to the profit squeeze as their No. 1 problem.

Wages, influenced by contracts providing for automatic increases and cost-of-living adjustments, are moving upward much faster than gains in productivity, they say.

Material prices (and many mention steel) are subject to hefty annual adjustments, reflecting the long term wage contracts. In addition, extra charge changes result in substantial intermediate hikes.

Selling prices are hemmed in by the stiffest competition in several years. Some say price competition is the toughest it has been in a decade. Others say their industry prices are lower than they were a year ago, despite increased costs.

Result—Earnings as a precentage of sales are dropping. Responding companies report they made 5 per cent on sales during the second half of 1956, but they think the figure will slack off to 4.6 per cent in the final six months of 1957. That represents an 8 per cent dip in profits after taxes.

Timid—Many managers show a reluctance to adjust their selling prices to recover inflated costs. They fear the prospect of still tougher selling in a buyer's market. They also complain that cheap imports are aggravating the competition problem.

Many see their hope for maintaining a fair profit in the installation of ever-better production equipment that lowers unit manufacturing costs despite higher wages and material costs.

A few say they are going to figure a fair profit into their selling prices, then emphasize quality, service and engineering rather than price in their selling efforts.

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Revolution in Transportation

Pipelines for solid materials augur transport changes. American Gilsonite is using one now. Cleveland Electric Illuminating soon will activate another

INTEREST in pipelines as another way of transporting solids is being spurred by two projects. American Gilsonite Co. has placed a 72-mile line in operation. Cleveland Electric Illuminating Co.'s 108-mile coal line has passed test runs.

The prospect: For mining and industrial firms handling material that can be shipped as a slurry, pipelines offer potentially big savings in transportation costs.

First Two—CEI's line runs from the coal fields near Cadiz, O., to the utility's Eastlake power plant, near Cleveland. It will furnish a large percentage of the fuel required by that plant.

In the American Gilsonite operation, a slurry (35 per cent ore, 65 per cent water) will be pumped from that company's mine at Bonanza, Utah, to its new refinery in the Grand valley of Colorado.

The refinery is the first privately owned facility in the country to produce petroleum products from solid hydrocarbons. (Gilsonite is the tradename for the mineral used.)

Availability of a market for gasoline, rail facilities for shipping coke, and labor dictated the location of the refinery. Because truck transportation of the ore in quantities desired was costly, American Gilsonite had the Colorado School of Mines Research Foundation conduct pipeline tests. Wilson-Snyder Mfg. Co., Braddock, Pa., did the pumping tests and explored the pipeline's feasibility.

Handling of Solids—The 6-in. line is laid on a reasonably flat slope except for 2 miles past the summit of Baxter Pass where 21-degree slopes are necessary. Before entering the line, the slurry is kept uniform by constant agitation in two 200,000-gallon tanks.

Measures to provide insurance against a plugged line include a spare motor at the pumping site and an 8500-ft high reservoir at Baxter Pass. The reservoir can flush the system in both directions. Another high pressure pump at the refinery can be used to backflush the line.

Most of the line crosses uninhabited country and is buried 3½-ft below the frost line with two exceptions. Suspension bridges (600 and 700 ft long) were necessary to cross a river and canyon.

Savings Substantial—At capacity, the line will transport about 700 tons of Gilsonite ore daily. Savings over trucking costs amount to "several dollars" per ton, officials say.

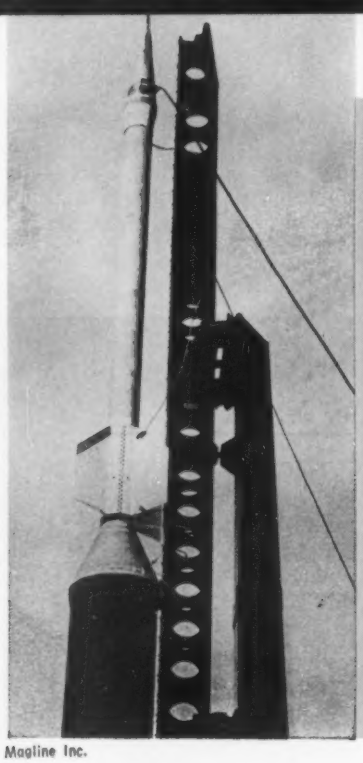
American Gilsonite Co. installs a pipeline for solids

E. T. Weir Dies

ERNEST T. WEIR, 81, honorary founder-chairman of National Steel Corp., Pittsburgh, died June 26.

Mr. Weir was born in Pittsburgh, Aug. 1, 1875. At the age of 15, he joined Braddock Wire Co. and a year later went with the Oliver Wire Co. in Pittsburgh. In 1901, he became manager of the Monongahela Tin Plate mills of American Tin Plate Co. and two years later became manager of its Monessen mills. In 1905, he and J. R. Phillips organized the Phillips Sheet & Tin Plate Co. in Clarksburg, W. Va. Three years later he was elected president. The company purchased the plant and equipment of Weirton Steel Co., Weirton, W. Va., in 1915. In 1918, the Phillips company changed its name to Weirton Steel Co. Mr. Weir continued in the chief executive position.

National Steel Corp., which he founded, was incorporated in 1929, merging Weirton Steel Co., Great Lakes Steel Corp. and Hanna Iron Ore Co. Michigan Steel Corp. and other operations were added later.



Magline Inc.

What Aircraft-To-Missile Shift Means

(Air Force procurement in billions of dollars)

	Fiscal 1956	Fiscal 1960
Manned aircraft	4.0	2.0
Missiles	0.5	2.8
Engines (missile & aircraft)	1.5	1.0
Electronics	0.75	1.3
Aircraft-missile production (rate per month)	6.5 million lb	2.7 million lb
Surplus production space in aircraft-missile industry	22.5 million sq ft	57.0 million sq ft

Faster Shift to Missiles

AT A SECRET meeting with top aircraft and missile industry executives, the Air Force detailed its procurement program: Dollar volume will hold; production will drop.

The figures above give you a preview of what the aircraft and missile industry will look like in about four years. Air Force procurement (excluding research and development costs and maintenance and operational spending) will climb only $350 million. From the fiscal 1956 base of $6.75 billion, procurement will hump out at the beginning of calendar 1958 and will run at around $7 billion to fiscal 1960 at least.

More Missiles—This program is the AF's answer to President Eisenhower's request to hold the budget line. Admittedly, the effort to contain defense spending has political overtones, but optimists in Washington say our weapon technology is so advanced that we can set a ceiling of around $38 billion a year for defense through 1960.

Present programs of the Defense department would overshoot that mark by $2 billion in fiscal 1958, says AF Secretary J. H. Douglas. The AF will account for $1.2 billion of the excess.

So, the shift from manned aircraft to missiles has been accelerated. The Army and Navy are expected to announce similar cost cutting programs soon.

Deliveries Updated — The spectacular growth of the missiles program accounts for the AF's increased costs; payments on the program in fiscal 1957 were double the original estimate, says Mr. Douglas. Lead time on some components has been cut from two years to four-six months. Some programs will be slowed down, and others will be dropped to give the AF the money it needs.

Less Aircraft—By 1958, the AF will have cut out 10 per cent of its present 137-wing strength. To make each dollar produce as much defense as possible, savings will go into missiles.

New Line-Up — Mr. Douglas names these programs as high on the priority list: DEW lines, SAGE air defense systems, the B-52 program (which is one-quarter complete), the K-135 tanker program, the B-58 (which is being test flown), two intercontinental missiles, two intermediate range missiles, a follow-up bomber to the B-52 and the atom powered bomber.

Besides Mr. Douglas, the AF called several people to brief the industry executives: D. C. Sharp, assistant secretary of the AF (materiel); Lt. Gen. C. S. Irvine, deputy chief of staff, materiel; Maj. Gen. D. H. Baker, head of the Air Materiel Command. They pulled no punches in outlining the AF's new position, which has been indicated for the last six weeks (STEEL, May 20, p. 101; May 27, p. 60).

No Increase in R&D—General Baker reports research and development expenditures will run a steady $600 million a year. The complexity of modern weapons leads to "tremendously high" development costs: So high, he notes, that those costs control the decision to undertake new programs.

Finally, initial costs can't be

If you're an Air Force contractor or subcontractor . . .

Here's what you can expect:

1. Tighter AF cost controls.
2. Minimum overtime.
3. End of some programs, particularly in manned aircraft.
4. Stretch-out of many programs.
5. Acceleration of some missile programs.
6. Slowdown in new research.
7. End of some old research.
8. Higher unit costs in some stretched-out programs.
9. Demand for more accurate estimates on contract bids.
10. Elimination of dual sources.
11. Fewer prime contractors.

Here's what you can do about it:

1. Switch to quality, not quantity, engineering.
2. Forget overtime; consider one-shift advantages.
3. Be prepared to cut personnel as much as 12 per cent.
4. Don't charge executive pay boosts to AF contracts.
5. Eliminate sloppy subcontracting.
6. Don't expect the AF to furnish many new facilities.
7. Accept the weapon system concept: One contractor brings the whole package together.
8. Eliminate duplicate engineering capabilities.
9. Step up your quality.
10. If you're a prime contractor, get more cost knowledge of the subsystems which go into your package.

written off in high production runs later. The aircraft industry must live with the fact that where it once produced 500 of an item a month, it will be producing only ten or less a month.

Mr. Sharp asks almost the impossible of the industry: "We must find ways to reduce overhead and other expenses to keep the cost of the product closely, if not exactly, the same as they were when they were produced in higher quantity." His solution: "Maybe you are going to have to change your way of doing business" (see check list).

In connection with these changes, the AF will concentrate more than ever before on one prime contractor as the weapons system manager.

Fadeout of Turbojets—"In the next few years, there will be a 40 per cent reduction in the installation of turbojet engines for aircraft and missiles," says General Baker. That decline will be partially offset by rockets and ramjets, but such capacity has largely grown up outside the turbojet industry.

"The projected production of jet engines will not support the present complex of jet producers. The problem in this industry is as severe, or even worse, than that of the aircraft industry itself," concludes General Baker.

Decline of Air Frame—When the AF decides to displace an aircraft frame with a missile frame, you lose 80 per cent of the frame poundage. By 1962, air weapon production will total only 2.5 million lb per month, compared with the present 6.5 million lb.

Fewer Prime Contractors—New programs, says General Baker, must be limited to those "that will give us large jumps in performance." So money will flow into the aircraft and missile industry at about the same rate as now, but through a much more limited number of prime contractors—the weapons systems managers.

Outlook for the air frame industry: If the prime contractor holds both aircraft and missile contracts, he may balance out his business. The air frame producer without missile responsibilities will have to look elsewhere.

Present missile prime contractors will hold their work, says General Baker.

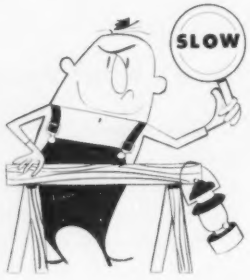
Challenge to Electronics—Companies which furnish missile weapon system primes with electronic equipment, specialized hardware and accessories will get a bigger share of the AF pie, but electronic firms must meet the problem of building and designing complete weapon subsystems. Then the prime's role can be held to the "phasing and integrating" of subsystems.

Too many electronic companies, notes General Baker, lack full knowledge of weapons subsystems and have forced primes to do their job for them.

And Small Business—With fewer primes and with less direct government supervision over the delegation of the funds, there will be fewer direct contracts placed with small firms, says General Baker.

And Labor—The aircraft industry ranks as the nation's largest employer, says Aircraft Industries Association of America. Its payroll: About 900,000 persons. Plants will be closed under the AF cutback. In addition, the AF plans a much closer look at the use of production men in plants that remain open.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Highway Program Hits Roadblocks

CONSENSUS: Everyone expected too much too soon from the federal highway program. Now the word is that the original 41,000-mile program, designed to extend over 13 years, will go 20 years and total 48,000 miles. The Senate Roads Subcommittee will approve such legislation early in 1958.

That won't be the end, though. Observers expect new plans to be approved every year: The federal government is in the highway business to stay. Plans call for the government to spend $1.7 billion in fiscal 1958; $2 billion in 1959; $2.2 billion in 1960. States match those funds. The original $25-billion program will probably grow to $50 billion over the 22-year span. Current cost breakdown: Labor, 25 per cent; materials, 44 per cent; equipment and overhead, 30 per cent.

Some States Do Better Than Others . . .

Bertram D. Tallamy, federal highway administrator, thinks it will be 1960 before the new system is far enough along for everyone to realize its importance, but he contends it's on schedule. He is certain the 41,000-mile program will be completed in 1969.

Some states seem to be lagging behind others in the matching of federal funds. The American Road Builders Association's executive vice president, Maj. Gen. Louis W. Prentiss, analyzes the situation this way:

1. Some states lack proper condemnation authority to obtain rights of way.
2. Some lack the funds.
3. Some require funds for the entire road contract to be in escrow before the contract is let.
4. Apportionment of money to the states is limited to funds available in the highway trust fund.
5. Public hearings in some states drag out too long.
6. Some public groups always oppose putting a highway in certain locations.
7. Some states can't get all the money they need.
8. There's a shortage of highway engineers.
9. Some states aren't fully using electronic devices to speed up the processing of engineering details.
10. Some states aren't utilizing outside engineering talent to augment their highway departments.

Defense Shuts Off R & D Overtime

The original Defense department order curtailing overtime on defense contracts now has been broadened to include research and development contracts—as well as production and construction contracts. The order is effective upon receipt by the contractor, on July 19, at the latest.

Old contracts will be reviewed "without delay" says Defense. Overtime will be eliminated or contracts will be stretched out. In line with the trend from manned aircraft to missiles (page 38), look for Defense to double check any special requests for overtime on a contract for other than missile programs.

Labor Department Challenges Industry

James T. O'Connell, undersecretary of labor, thinks it is about time industry and labor wake up to the manpower shortage ahead. The Labor department will hold a series of conferences this fall to pinpoint the problem: The population will jump to 200 million in ten years, but we'll add only 10 million to our labor force. Half will be women, the other half over 45, says Mr. O'Connell. We'll add no male workers in the important 25 to 44 age group. The 25-34 group will show a decline of 750,000 men.

Mr. O'Connell notes that we'll need: Almost 5 million more skilled and semiskilled industrial workers, another 2 million professional and technical workers, another 5 million white-collar workers.

Pat on Back for Small Business

No one is too excited about Office of Defense Mobilization's latest amendment to order VII-7 expressing the agency's concern that it is "national policy to protect the interests of small business."

Sen. John Sparkman (Dem., Ala.), chairman, Small Business Committee, got Defense Mobilizer Gordon Gray to include the thought that small firms will participate in the maintenance of the mobilization base, "including current procurement."

Foreign Scrap Market To Open Up?

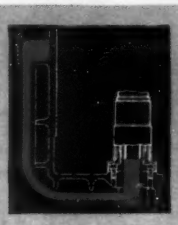
The European Coal & Steel Community has assured the State department that it will try to eliminate "restrictive" practices in its scrap buying program in the U.S. An exclusive contract with a small group of U.S. firms was discontinued in November, 1955, but ECSC continued to purchase most of its scrap from the same group. Charges before Rep. Wright Patman's (Dem., Tex.) Small Business Commitee indicate the Japanese market has been similarly closed, although no formal agreement seems to have been in force.

Inside Story of a Smart Buy for Your Shop...

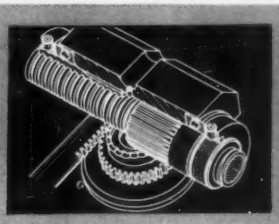
It's a good idea to look "under the hood" when buying machine tools. Hidden features may give you some real clues to the machine's potential for your particular objectives. A quick look "under the hood" of CINCINNATI® ML and MI Milling Machines reveals a host of features that work unseen toward the common goal of every shop ... to reduce the cost of production. Five features are illustrated below. Of course, there are many more. Would you like to have additional information? For brief data look in Sweet's. Or, for complete specifications, write for a copy of catalog No. M-1916-2.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

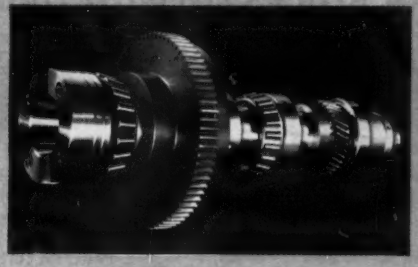
Cradle type mounting for spindle drive motor greatly simplifies removal and servicing of the motor.



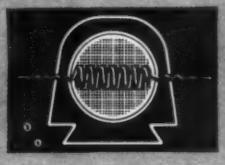
Vertical screw is submerged in a bath of oil from its own reservoir, assuring long, accurate life.



Automatic backlash device increases productivity. Machine can mill equally well as the table feeds to the right, left or alternately right and left.



Anti-friction mounting with center support for the heavy spindle assembly, smoothly transmits maximum cutting power.



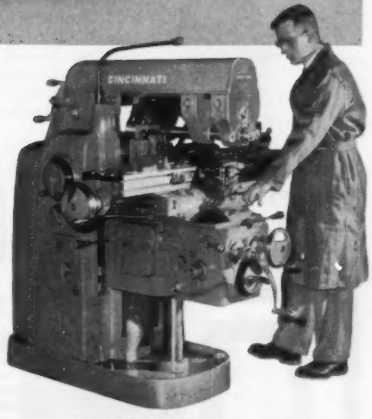
Dynapoise overarm smooths out the cutting action; provides straight-edge alignment for arbor supports.

Brief Specs CINCINNATI ML and MI Milling Machines

Size	No. 2ML		No. 2MI			No. 3MI	
Style	Plain	Univ.	Plain	Univ.	Vert.	Plain	Univ.
Longitudinal Range...	28"	28"	28"	28"	28"	34"	34"
Sixteen Spindle Speeds	25-1500 rpm all sizes and styles (higher and lower ranges optional)						
Sixteen Feeds.....	¼-30" per min., all sizes and styles						
Motor Drive: Spindle..	3 hp	3 hp	5 hp	5 hp	5 hp	7½ hp	7½ hp

CINCINNATI

MILLING MACHINES • BROACHING MACHINES • CUTTER AND TOOL GRINDERS
METAL FORMING MACHINES • HARDENING MACHINES • OPTICAL PROJECTION
PROFILE GRINDERS • CUTTING FLUID • GRINDING WHEELS



CINCINNATI No. 2 MI MILLING MACHINE
Catalog No. M-1916-2

Square D FOR THE MOST COMPLETE line of Oil-Tight

PUSHBUTTONS

Square D pushbuttons, designed to JIC and NMTBA standards, have been proven by severe tests involving millions of operations. They offer still other features...generous wiring space and exclusive *"Slide and Swing"* enclosure covers for easier, faster installations when machine operations are changed.

OIL-TIGHT OPERATORS

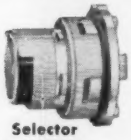
Momentary Contact Guarded button in 7 colors.

Mushroom Button 1⅜" or 2¼". Momentary contact. 7 different colors.

Selector Switch 2 or 3 position with 4 different cams.

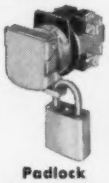
Coin-operated Selector Switch Available in same selection as standard type.

Key-operated Selector Switch Discourages unauthorized operation.

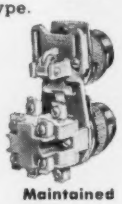


Selector Pushbutton combines selector switch and pushbutton. 2 or 3 position.

Padlock Attachment Latch type. For momentary contact buttons. Locks "OFF" position.



Padlock Attachment Covertype. Prevents depressing button.



Maintained Contact Attachment Used with 2 operators, 1 contact block.

Selector Switch Lockout Permits switch to be locked in any one of three positions.

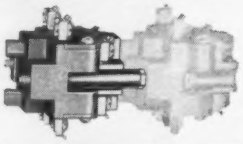
Wobble Stick Operator for momentary pushbutton operator. Ideal for emergency stop with pendant station.

Neoprene Cap for momentary contact button. Prevents liquids, dust and grit from working into pushbutton operator.

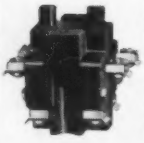
CONTACT BLOCKS and PILOT LIGHTS

Single Pole N.O. and N.C. Contacts

Duplex N.O. and N. C. Contacts



Tandem Operation. Duplex N.O. and N.C. Contacts with extended stems for combination with another block.



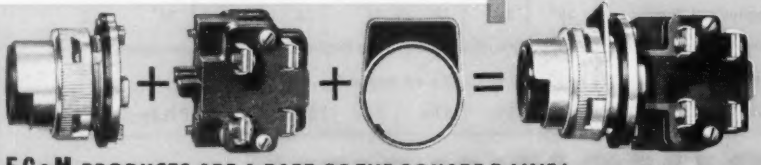
Duplex N.O. and N.C. Contacts with one N.O. circuit closing ahead of the other. Designed for 2-speed or sequence operations.

PILOT LIGHT • Generous illumination and wide-angle visibility. Greatly reduced filament burn-outs. No loosening of lamp under vibration. Six colors—red, amber, green, blue, white, clear.

You'll like the *completeness* of Square D's pushbutton line. Every conceivable combination can be obtained with a minimum stock of packaged units. Enclosures available for 1 to 16 units.

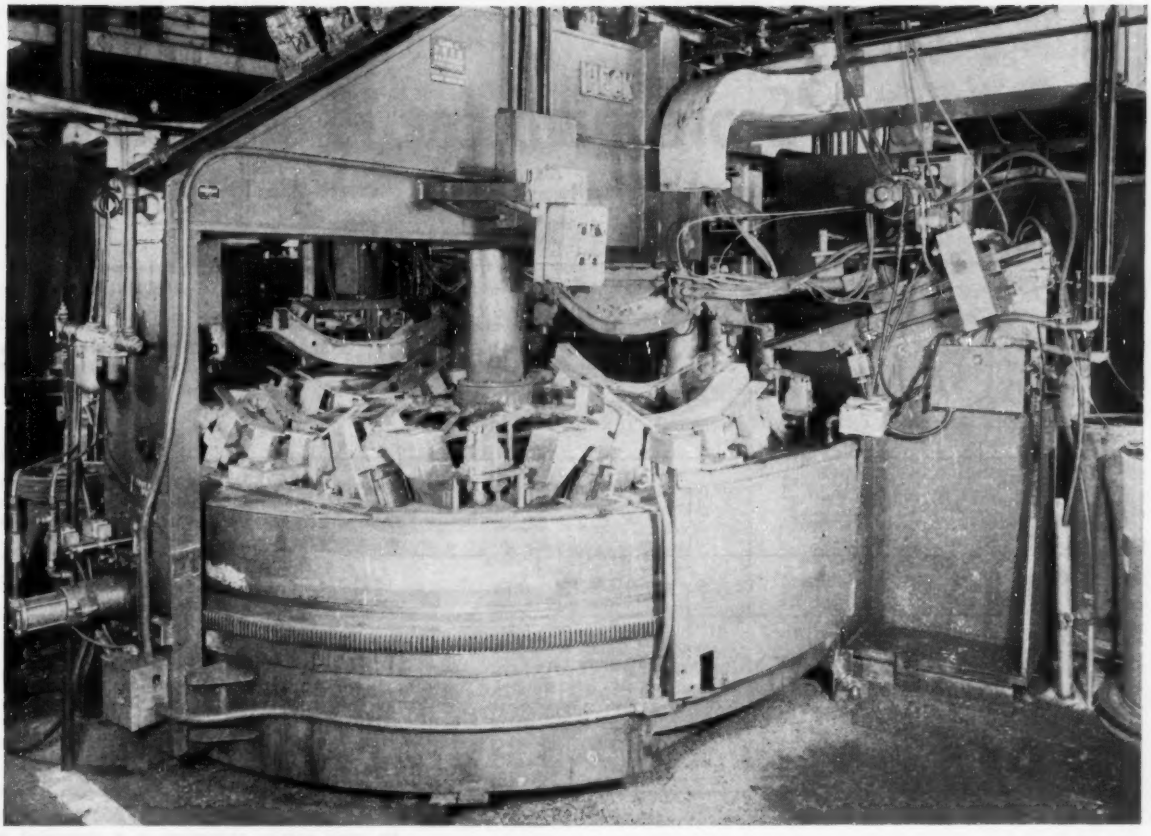
Write for Pushbutton Bulletins which give complete details. Address Square D Company, 4041 North Richards St., Milwaukee 12, Wisconsin.

ANY OPERATOR WITH ANY CONTACT BLOCK



NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY



This machine turns out 250 welded car frame crossmembers an hour at Midland Steel Products Co.'s Detroit plant

Welding Speeded With CO_2

MIDLAND STEEL Products Co., Cleveland, is getting 290 in. of weld per minute on each of four automatic CO_2 welding heads on a new machine at its Detroit plant. It turns out 250 Chrysler frame crossmembers an hour.

Why They Use It—"Doing the same job manually, we could get 10 in. per minute per operator," says William E. Smith, Midland's welding engineer. One man loads and operates the automatic.

The company is installing a similar unit in its Cleveland frame plant to weld Buick side rails. It probably will have six or eight welding heads, says Mr. Smith.

Although the crossbar job normally calls for fillet welding, he says Midland's experience indicates through welding works better.

How They Use It—The setup works this way:

- An operator places the two sides of the crossbar into the first station of the machine.
- The unit automatically cycles to the next station where air clamps apply pressure (800 or 900 psi) to hold the sections together.
- Four welding guns move in and lay down a bead. The heads are synchronized so two working from one end of a crossmember reach the center first. They back off slightly to avoid bumping the two arriving from the other direction.
- Electromagnets pick up finished parts at the final station and transfer them to a drilling station. No further finishing is needed.

What CO_2 Does—In conventional welding, oxygen introduces oxides at normal welding temperatures. This creates porosity in the weld seam.

CO_2 acts as a shielding agent to keep impurities away from the weld, providing a clean union.

The inert gas shield also means higher amperage can be used to generate the greater heat needed for through welding.

Midland uses better than 800 amperes, and Mr. Smith thinks 1600 is possible. Manual welders use about 350.

Higher temperatures also permit the use of smaller diameter carbon welding rods (1/16-in.). "We find CO_2 is the best gas to use when welding with carbon rods," says Mr. Smith.

What They Save—Even though CO_2 and smaller rods are expensive, Midland is saving 50 per cent on material costs, owing to the rate at which metal is deposited, and the job requires less labor than manual welding.

Scoreboard for 15 Rare Metals:

	Industrial U. S. Consumption		Mine Production	
	1952	1956*	1952	1956*
BARITE	1,033,843	1,550,500 short tons	1,012,811	1,200,000 short tons
BERYLLIUM	3,476	4,500 short tons of beryl (10 per cent BeO content)	515	550 short tons of beryl (10 per cent BeO content)
BISMUTH	1,775	1,500 thousand lb	Refinery production is confidential. Min. output not available: Bismuth is produced as a by-product. Imports: 800 thousand lb in 1956; 708 thousand lb in 1952	
BORON	480,536	900,000 short tons	583,828	1,124,000 short tons
COLUMBIUM-TANTALUM	700	600 short tons	2.7	6.2 short tons
GERMANIUM	—	22,000 lb	Refinery production was about 25,000 lb in 1956. No mine output; germanium is a by-product of zinc refining. Imports: 4000-8000 lb in 1956	
LITHIUM	—	—	15,611 short tons. (Latest production figures are for 1954: 37,830 short tons)	
PLATINUM METALS	454.2	735.0 thousand troy oz	34.4	23.0 thousand troy oz
RHENIUM	Confidential		Confidential, but the U S. probably produces enough for industrial needs	
SELENIUM	802	1,140 thousand lb	687	1,000 thousand lb
STRONTIUM	—	—	Output varies, but never more than several hundred tons annually. The U. S. imported 6,500 short tons in 1956; 9,517 short tons in 1952	
TELLURIUM	155	170 thousand lb	189	150 thousand lb
THORIUM	37,925 (All industrial consumption is under Atomic Energy Commission authorization for nonenergy use. Quantities include thorium compounds)	100,000 thousand lb	Classified	
URANIUM	Classified		Classified	7,500 short tons
VANADIUM	—	3,869 thousand lb	5,143	7,000 thousand lb

Source: U.S. Bureau of Mines.
*Estimated.
†"Minimum" and "long term" refer to the two objectives set up by Office of Defense Mobilization for wartime needs of the metals.

Their Status, Prospects

Domestic Reserves	U.S. Stockpile	†Known Research in the field
Over 40 million tons	None	Bureau of Mines: $25,000 in 1957; $5,000 in 1956
8530 tons of 10 per cent BeO beryl in deposits containing 1 per cent beryl. 270,000 tons 10 per cent BeO beryl in deposits containing 0.1 per cent beryl	Minimum: completed. Long term: May be completed	Bureau of Mines: $45,000 in 1957; $35,444 in 1956
30 to 50 million lb	Minimum: Completed. Long term: May be completed	Bureau of Mines: $30,000 in 1957; $20,000 in 1956. Private industry is spending more than the Bureau
Adequate for many years at present rate of consumption	None	Bureau of Mines: $25,000 in 1957; $5000 in 1956
850,000 lb	Minimum: Completed. Long term: Completed on tantalite; may be completed on columbite	Bureau of Mines: $77,000 in 1957. Private industry programs are extensive and confidential. Other government agencies may be spending several times what the Bureau is spending
200,000 lb	None	"Little"
138.8 million short tons of Li_2O	None	Bureau of Mines: $20,000 in 1957; $5,000 in 1956.
300 thousand troy oz	Minimum and long term completed for iridium and platinum. They may be completed for palladium	No government research
—	None	Bureau of Mines: $8000 in 1957
19 million lb	Minimum and long term may be completed	Bureau of Mines: $5000 in 1957. Other government agencies will spend $95,000, compared with $33,333 in 1956. Private industry may be spending $50,000 a year
3.5 million tons	Minimum and long term may be completed	Bureau of Mines: $5000 in 1957. Private industry is conducting "little" research
—	None	Private industry is spending less than $50,000 a year
36 million lb ThO_2	None	Bureau of Mines: $50,000 in 1957. Atomic Energy Commission research expenditures are "high"
60 million short tons	Classified	Classified
—	Minimum and long term are completed	Bureau of Mines: $158,000 in 1957. $49,000 in 1956

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Building, Cleveland 13, Ohio*

Hits U.S. Control

Tyson tells Senate committee that employee pension plans need no federal law

LACK OF evidence of any need for more public control of employee pension plans should weigh heavily in congressional discussion of federal laws on the subject, believes Robert C. Tyson, chairman of the finance committee of U.S. Steel Corp.

Mr. Tyson was the lead-off witness before the Senate subcommittee on welfare and pension plans, which is headed by Sen. John F. Kennedy (Dem., Mass.).

States' Rights—"There may be a small minority of such plans which do require scrutiny," Mr. Tyson said. "However, there is much merit in letting the matter of public supervision be developed and tested by the states through extension, if need be, of the supervision that is already in existence."

Expressing doubt as to the desirability of federal laws controlling pension plans, the steel official continued:

"In the event that such legislation should be forthcoming, it is my hope that it be aimed primarily at the correction of abuses where abuses have been shown to exist, and that every effort should be made to limit the burdens and expenses entailed not only to the government, but to the half million or more plans now in existence."

Any attempt at regulation, he said, would be likely to reveal confidential investment policies.

Recommendations — Mr. Tyson gave the subcommittee these suggestions:

1. Any legislation should deal with reporting and disclosure rather than regulation.
2. Plans under which the employee relies on the employer rather than a specific fund should be exempt.
3. Limit collection of data to areas where abuses are known to have occurred.
4. Let the Securities & Exchange Commission, "a continuing bipartisan entity," or the Internal Revenue Service handle such reporting rather than the Department of Labor.

How Great Lakes Steel *inspects scrap* quality

Two things don't belong in this gondola—and a team of trained Great Lakes Steel scrap inspectors is searching them out. The intruders are *non-ferrous material* and *high sulphur content ferrous material*, which contaminate heats and spoil the quality of finished steel.

Additional visual inspection in the stockhouse and on the open-hearth floor, magnetic screening, and weight checks all combine to detect and eliminate these adulterants, before the scrap is fit to become a part of Great Lakes steel.

Sound like a lot of trouble? It's worth it, to us and to our customers. And it's just one more step in Great Lakes Steel's continuing program of quality control that assures you the finest steels. Make it a point to contact your Great Lakes Steel representative for the rest of the story. He's as close as your telephone.

Here approved scrap, in charging boxes on buggies, heads for the open hearths. Quality scrap gives finished steel improved surface and ductility characteristics.

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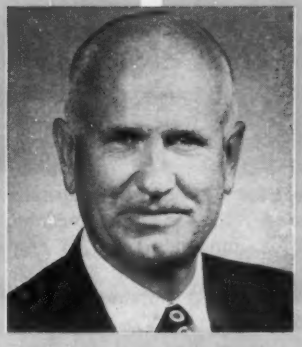
Who Will Succeed GM's Harlow Curtice?

LOUIS C. GOAD

Dark Horse?

FREDERIC DONNER

Du Pont Backed?



IVAN WILES

Still Favored?

Curtice Due To Retire in '58

WHAT will happen when Harlow Curtice reaches GM's automatic retirement age?

GM's president will be 65 on Aug. 15, 1958, just a year from now. It's a cinch the board has been giving a lot of thought about his successor for some time.

Everybody's Business — Some circles might think the presidential race is nobody's business but GM's. The truth is a large segment of industry is affected by what future course the auto maker pursues.

That course, to a large extent, will be shaped by the man who heads the outfit. Obviously, nobody knows for sure who will be picked, but a speculative summary runs like this:

Could Continue — Mr. Curtice could be asked to stay on. His health is good. GM has prospered under his reign. He loves his job.

If he wants to stay, approval undoubtedly would be automatic—

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probably for a year at a time. Even when he does step down, it will be to a consulting position.

Three Choices—Most dopesters are betting on one of GM's three executive vice presidents to replace him when he does retire.

One: Manager — Ivan Wiles, head of dealer relations, has been tagged as the favorite candidate.

He followed Mr. Curtice up through the Buick ranks and is considered a strong member of the "Flint (Mich.) crowd" which grew to power during World War II.

Mr. Wiles underwent a rather serious operation but is in excellent health today. Like Mr. Curtice, he has a basic background in accounting and plenty of managerial experience from his days as Buick's general manager.

He moved up to his present post last year. The 1957 Buicks were styled under his direction. Some folks feel the poor showing Buick is making this year can be partially attributed to him.

Two: Financier—Frederic Donner was named an executive vice president only a month after Mr. Wiles. He's president and chairman of the financial policy committee, having followed in the footsteps of Albert Bradley, GM's board chairman.

Mr. Bradley has the backing of the Du Pont clan which owns 23 per cent of GM's stock. Despite the recent Supreme Court decision, Detroit is convinced that Du Pont power will be a strong factor in GM circles for some time to come (see STEEL, June 17, p. 67).

Mr. Donner has had relatively little experience in divisional operations. Most of his efforts have been in guiding the financial life of the giant car builder.

He has been a member of the financial policy and operations committees, GM's top governing bodies, for ten years. He's the only candidate on the financial side.

More important, Mr. Donner probably would be more eager to engage in developing a stronger marketing setup. He's not apt to have any divisional preferences. Detroit is beginning to turn its efforts from manufacturing to marketing. GM will be sure to lead the way.

Three: Engineer — Louis C. Goad has been an executive vice president in charge of automotive and parts divisions since 1951.

He made his mark during World War II and has been instrumental in building up the B-O-P assembly concept. He was general manager of the Fisher Body Division from 1946 to 1948.

Unlike the other two execs, Mr. Goad is an engineer. Although he seldom seeks the limelight, he has a reputation for getting the job done coolly and efficiently.

Little Things Count — Health, age, company politics and preferences may seem like small matters in picking the head of a billion dollar corporation. But the decision will be based on just such points.

All three are about the same age.

Heirs Apparent — Although no announcement will be made for a year, Detroit circles already are looking to shifts in organization that follow a new president.

Edward Cole, general manager of Chevrolet, generally is considered as GM's brightest young star. He's mentioned as the presidential candidate once removed.

Another prospect is Semon E. Knudsen, Pontiac's general manager, and son of William Knudsen, former GM president. The promotion of these men can be the key to GM operations in 1970.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
5 Mo. Total	2,872,617	2,762,228
June		430,373
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
May 25	127,428	108,126
June 1	82,431	77,433
June 8	129,517	104,984
June 15	125,372	100,689
June 22	118,625†	105,148
June 29	115,000*	103,037

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Steel Orders Up Slightly

Automotive steel buying is picking up slowly. Most of the tonnage is in sample orders ranging from 1 to 100 tons. It's being used for die tryouts.

Slightly stronger buying is expected as fabricators start building up the crop of 1958 dealer and display cars which have to be distributed in time for new model announcements.

Delivery time runs about two weeks. Purchasing agents indicate there's no rush to get orders on the books before the price goes up (probably this week).

Chevrolet seems to be the only car division still buying any quantity of steel for '57 production. The GM division originally stepped out of the market, but recently came back with fairly large tonnage requests for July delivery.

Shutdown—Little action is expected from Buick and De Soto since both divisions shut down for two weeks to take inventory.

Such bookkeeping usually comes during the model change-over period. Buick production, however, is running 26 per cent behind last year's. The layoff may be to balance out unsold dealer stocks.

De Soto is more than 16,000 units ahead of 1956 in production and close to that in sales.

It may be trying to clean up odds and ends so it can make an extra fast model change-over to hit an October introduction date.

GM To Import Econ-O-Cars

General Motors jumped the gun on motordom predictors by announcing it will introduce its foreign-built Opel and Vauxhall Victor to the American market this September.

General feeling was the move wouldn't be made for at least a year, but the rapid surge of foreign economy cars apparently updated the decision.

Ford Motor Co., which imports its small British-built cars on a trial basis, is expected to follow.

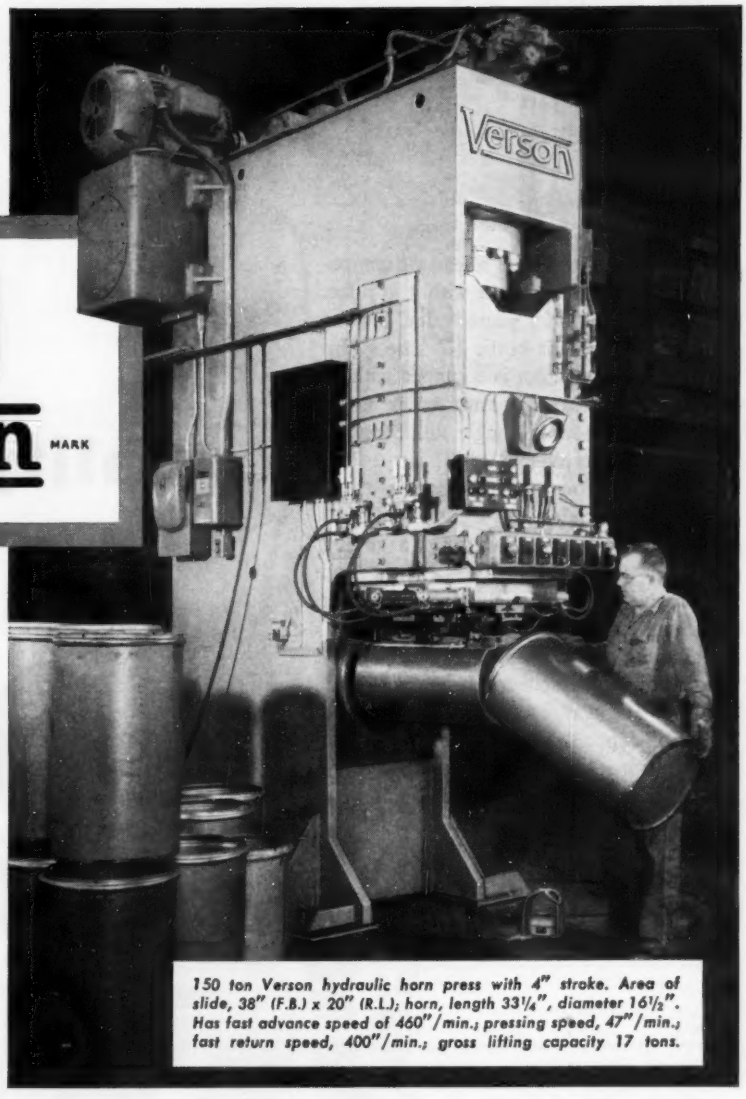
Harlow Curtice says the German-built Opel Rekord will be marketed through the Buick division. Pontiac will handle GM's British-built Victor line.

150 TON

TRADE **Verson** MARK

hydraulic HORN PRESS

coins and pierces openings on power line transformer containers



150 ton Verson hydraulic horn press with 4" stroke. Area of slide, 38" (F.B.) x 20" (R.L.); horn, length 33¼", diameter 16½". Has fast advance speed of 460"/min.; pressing speed, 47"/min.; fast return speed, 400"/min.; gross lifting capacity 17 tons.

This 150 ton Verson hydraulic horn press is in use at the Gadsden, Alabama, Works of Allis-Chalmers Manufacturing Company.

The press is employed to automatically coin and pierce 3 different openings, to accommodate various sized leads coming into power line transformer containers. When actuated, the press has a two stroke cycle. A combination coining and piercing die coins the part on the initial stroke—the second stroke is a piercing operation.

The press is equipped with full automatic electrical control and has varying tonnage control for each of the three stations. By preselection, the operator may exert the proper tonnage required to do each specific job.

This hydraulic horn, like all Verson machines, is much more than just a press. It's a production process, engineered and built to provide greater efficiency and production with reduced costs.

Put Verson's production know-how to work for you. Send an outline of your requirements —we'll make specific recommendations.

A Verson Press for every job from 60 tons up.

TRADE **Verson** MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • 8300 S. CENTRAL EXPRESSWAY, DALLAS, TEXAS

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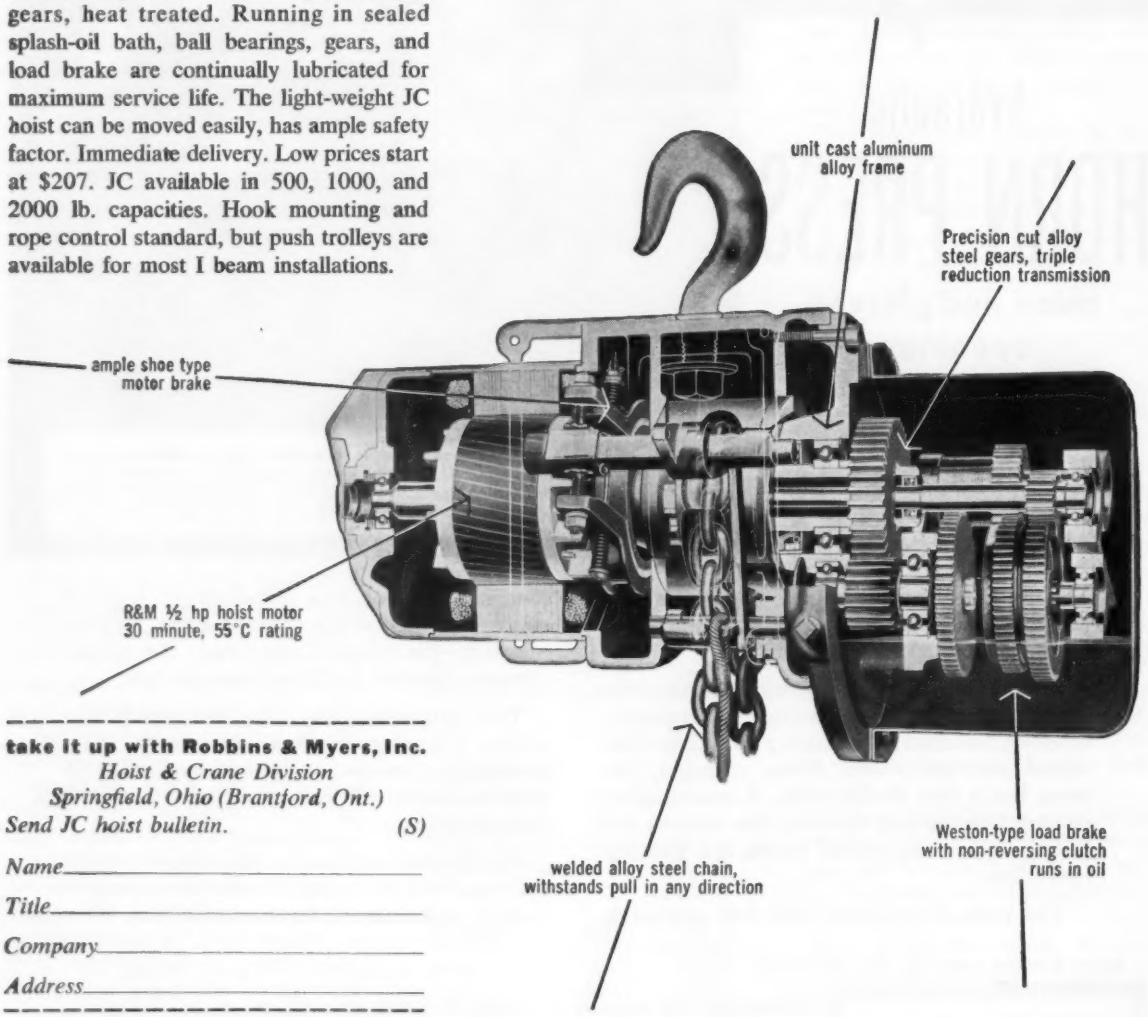
JC chain hoists are ahead of competition in quality—right with it in price. See for yourself why more value for the same money is yours in the JC. The ½ hp R&M heavy duty motor is equipped with an oversize shoe brake to assure quick stops, accurate load spotting, longer life. Separate load brake is Weston-type, with non-reversing clutch to prevent drift. Gearing—triple reduction precision cut alloy steel spur gears, heat treated. Running in sealed splash-oil bath, ball bearings, gears, and load brake are continually lubricated for maximum service life. The light-weight JC hoist can be moved easily, has ample safety factor. Immediate delivery. Low prices start at $207. JC available in 500, 1000, and 2000 lb. capacities. Hook mounting and rope control standard, but push trolleys are available for most I beam installations.

quality to spare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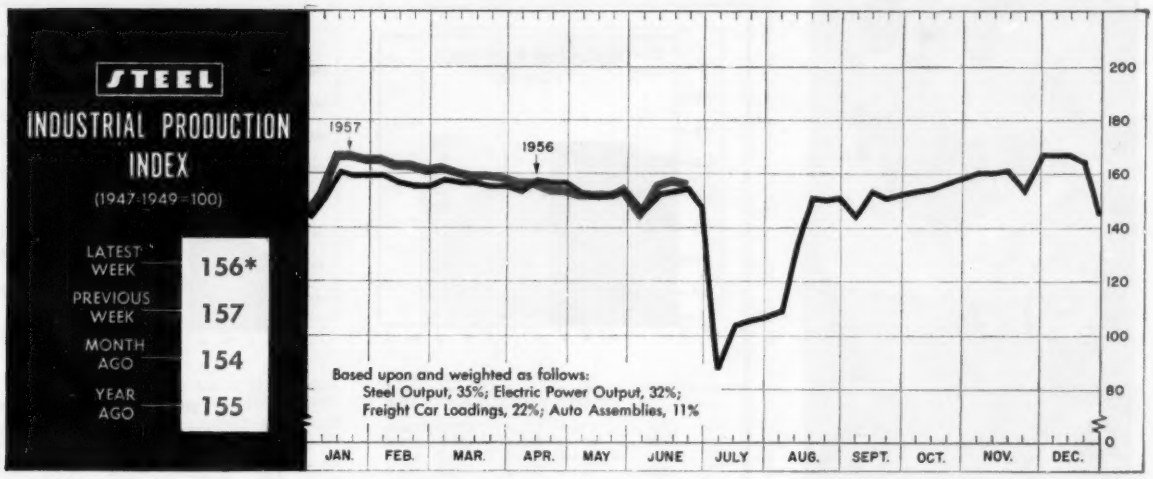

*Week ended June 22.

Seasonal Factors Depress Business Trends

BUSINESS COMPARISONS in the next two months will show a tremendous advantage for 1957 over 1956, but don't let them fool you. Activity during the summer will differ little from that of the first half—good but void of any marked unseasonal trends up or down.

The difference between this and last year's trend lines (see above) is explained by the steelworkers' strike. In the absence of any major strike, business trends will be influenced more by seasonal factors (mostly vacations) this summer than it has in many previous ones. The result: STEEL's unadjusted industrial production index may slip beneath 150 (1947-1949=100) for the first time since the third quarter of 1955, with the exception of holiday weeks and the 1956 strike period. The Federal Reserve Board's production index (adjusted) may decline to a low of 142 per cent of the 1947-1949 base by August, matching the year-ago level.

These Will Be Weak—In the case of STEEL's index, here is what probably will happen. Steel production and auto output will be the weak segments. Despite anticipated increases in steel prices, there has been little, if any, forward buying in an effort to beat rising costs. During the week ended June 23, ouput of 2,181,000 net tons for ingots and castings reached the second lowest point of the year. The American Iron & Steel Institute, whose estimates have been on the high side recently, predicted only a slight improvement for the following week. The low point for 1957 is still ahead because mass shutdowns for vacations will reduce demand until late in the third quarter.

The auto industry is beginning to cut back to reduce inventories, especially in the medium-priced group. Buick Division of General Motors will shut down during July 4-14 for annual inventory. (This usually takes place during model

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,220[1]	2,181	2,114
Electric Power Distributed (million kw-hr)	12,000[1]	11,958	11,478
Bituminous Coal Output (1000 tons)	10,295[1]	10,020	10,122
Petroleum Production (daily avg—1000 bbl)	7,150[1]	7,294	7,056
Construction Volume (*ENR*—millions)	$370.8	$417.7	$443.5
Auto, Truck Output, U. S., Canada (*Ward's*)	151,961[1]	156,224	139,728
TRADE			
Freight Car Loadings (1000 cars)	725[1]	746	799
Business Failures (Dun & Bradstreet)	265	289	286
Currency in Circulation (millions)[3]	$30,904	$30,903	$30,541
Dept. Store Sales (changes from year ago)[3]	−2%	+1%	+12%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,278	$20,766	$24,617
Federal Gross Debt (billions)	$274.5	$274.6	$275.6
Bond Volume, NYSE (millions)	$24.1	$21.3	$14.5
Stocks Sales, NYSE (thousands of shares)	10,903	13,229	7,997
Loans and Investments (billions)[4]	$86.8	$86.2	$85.2
U. S. Govt. Obligations Held (billions)[4]	$25.7	$25.8	$26.7
PRICES			
STEEL's Finished Steel Price Index[5]	228.59	228.59	210.45
STEEL's Nonferrous Metal Price Index[6]	218.2	227.4	276.1
All Commodities[7]	117.3	117.5	114.0
Commodities Other Than Farm & Foods[7]	125.3	125.3	121.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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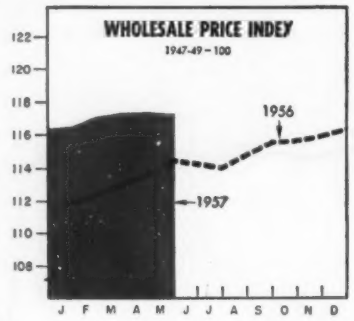
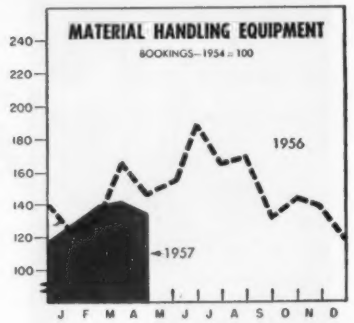
THE BUSINESS TREND



	All Commodities 1957	All Commodities 1956	Other Than Farm & Foods 1957	Other Than Farm & Foods 1956
Jan.	116.9	111.9	125.2	120.4
Feb.	117.0	112.4	125.5	120.6
Mar.	116.9	112.8	125.4	121.0
Apr.	117.2	113.6	125.3	121.6
May	117.1	114.4	....	121.7
June	....	114.2	....	121.5
July	....	114.0	....	121.4
Aug.	....	114.7	....	122.5
Sept.	....	115.5	....	123.1
Oct.	....	115.6	....	123.6
Nov.	....	115.9	....	124.2
Dec.	....	116.2	....	124.6

U.S. Bureau of Labor Statistics.



	1957	1956	1955	1954
Jan.	126.34	122.43	97.00	93.56
Feb.	139.29	129.56	98.71	96.45
Mar.	140.76	166.14	149.16	115.55
Apr.	132.67	145.20	109.52	121.76
May	.....	155.53	110.50	98.54
June	.....	189.13	139.00	112.42
July	.....	165.50	111.76	91.68
Aug.	.....	168.70	106.20	94.06
Sept.	.....	130.35	136.80	88.43
Oct.	.....	143.38	123.52	95.41
Nov.	.....	138.50	118.09	88.66
Dec.	.....	117.76	139.85	102.49
Avg	.....	147.68	120.01	100.00

Material Handling Institute Inc.

Charts copyright, 1957, STEEL.

change-over.) The De Soto Division of Chrysler Corp. is in its second week of shutdown. The Dodge Division, which produces De Soto Firesweeps at its main plant, will cut back that output next week. Several facilities of the Mercury Division of Ford Motor Co. were idled in late June.

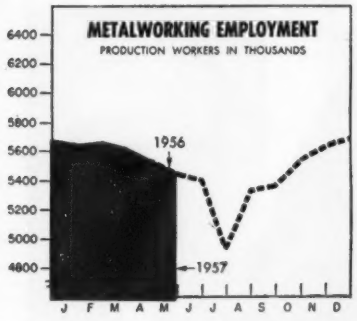
These Will Be Strong—Output of electric energy and freight car loadings will be the most stable elements in the index. Already taxed to the limit in some cities because of the heat wave, public utilities will face more of the same. The rapid rise of commercial, industrial and residential air conditioning has practically eliminated the summer slump in the production of electricity. Freight car loadings will not get much better, but they won't get much worse. Railroad shippers' advisory boards continue to be optimistic, but their predictions for the last two quarters have been far in excess of results.

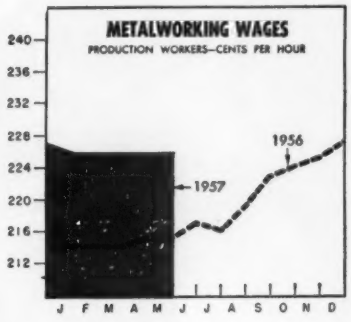
The FRB index, which takes into account such elements as the weather and annual vacations, has dropped a point a month since March. It will probably stay at 143 during June, then drop another point in July and stay there until the upturn sets in in September. While primary metals production declined nearly 7 per cent from January through May, metal fabricating dipped only 2.8 per cent, indicating that strong production trends are still current.

Failures Near Record

The gap between business failures and incorporations is narrower this year than at the corresponding point of 1956. Dun & Bradstreet Inc. reports that failures in May climbed to 1200 from April's 1175. The latest figure has been exceeded only once (in March) since 1941. All industry and trade groups except commercial service contributed to the increase. The failure rate of 50 per 10,000 firms listed in D&B's reference book was well under the 66 per 10,000 in prewar 1940. For the year to date (June 13), failures total 6778, compared with the year-ago total of 6147.

New business incorporations are running at a high rate although moderately below the record figures of 1956. In May, 11,986 charters were issued, compared with 12,078 in April and 13,142 in May, 1956. In the first five months of this year, new incorporations numbered 60,057, compared with 64,305





1956	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
May	1,117	881	1,281	872	1,295
June	1,118	870	1,278	866	1,269
July	743	825	1,254	854	1,250
Aug.	1,091	864	1,257	878	1,235
Sept.	1,126	885	1,262	891	1,205
Oct.	1,132	911	1,264	914	1,319
Nov.	1,132	911	1,273	918	1,402
Dec.	1,133	909	1,289	907	1,439
1957					
Jan.	1,130	906	1,299	892	1,440
Feb.	1,124	903	1,294	877	1,482
Mar.	1,112	898	1,291	869	1,474
Apr.*	1,090	890	1,277	853	1,436
May*	1,090	876	1,251	850	1,418

*Preliminary.
U.S. Bureau of Labor Statistics.

1956	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
May	233	204	218	196	226
June	234	206	219	197	228
July	227	206	220	198	229
Aug.	236	207	221	199	232
Sept.	241	211	225	201	236
Oct.	242	213	225	203	238
Nov.	244	213	225	204	239
Dec.	245	215	226	205	243
1957					
Jan.	247	213	226	206	237
Feb.	245	213	227	206	238
Mar.	246	214	228	206	238
Apr.*	246	214	228	206	238
May*	246	215	227	206	237

*Preliminary.
U.S. Bureau of Labor Statistics.

during the corresponding period last year.

PAs See Improvement

Purchasing agents seem satisfied with the current level of business, according to the June survey of the National Association of Purchasing Agents. Pressures of a growing boom are gone for the most part, but new orders and production are satisfactory. Thirty per cent of the respondents say business is better than it was a month ago, while 50 per cent say it's the same. New orders are up. Only 25 per cent report a worse condition, compared with 32 per cent so reporting last month. Employment is holding its own over-all, and with the exception of copper, lead and zinc, prices are stable.

The association says that there is still an inclination to reduce inventories. STEEL's quarterly survey of components (see page 99) indicates that this attitude may change in the near future.

Trends Fore and Aft

• Truck freight tonnage during the first quarter was 0.7 per cent ahead of what it was in last year's first quarter, reports the American Trucking Associations Inc. This is the third consecutive year in which first quarter tonnage has exceeded the year-ago mark.

• New orders for industrial furnaces totaled $3,994,000 in May, compared with $3,164,000 in April and $3,667,000 in May, 1956, says the Industrial Heating Equipment Association Inc.

• Sales of home laundry appliances in May rose 3 per cent over April's to 298,075 units, reports the American Home Laundry Manufacturers' Association.

• During the first five months of this year, 43 new industries and 167 expansions have accounted for 6973 new jobs and $85.3 million in capital investment in the Los Angeles area.

• Net new orders for resistance welders came to $2.3 million in May, compared with $2.4 million in April, reports the Resistance Welder Manufacturers Association. May shipments came to $2.9 million, against April's $3.1 million.

• Sales of standard size vacuum cleaners dropped to 231,246 in May, down 17.9 per cent from the April figure, according to the Vacuum Cleaner Manufacturers' Association.

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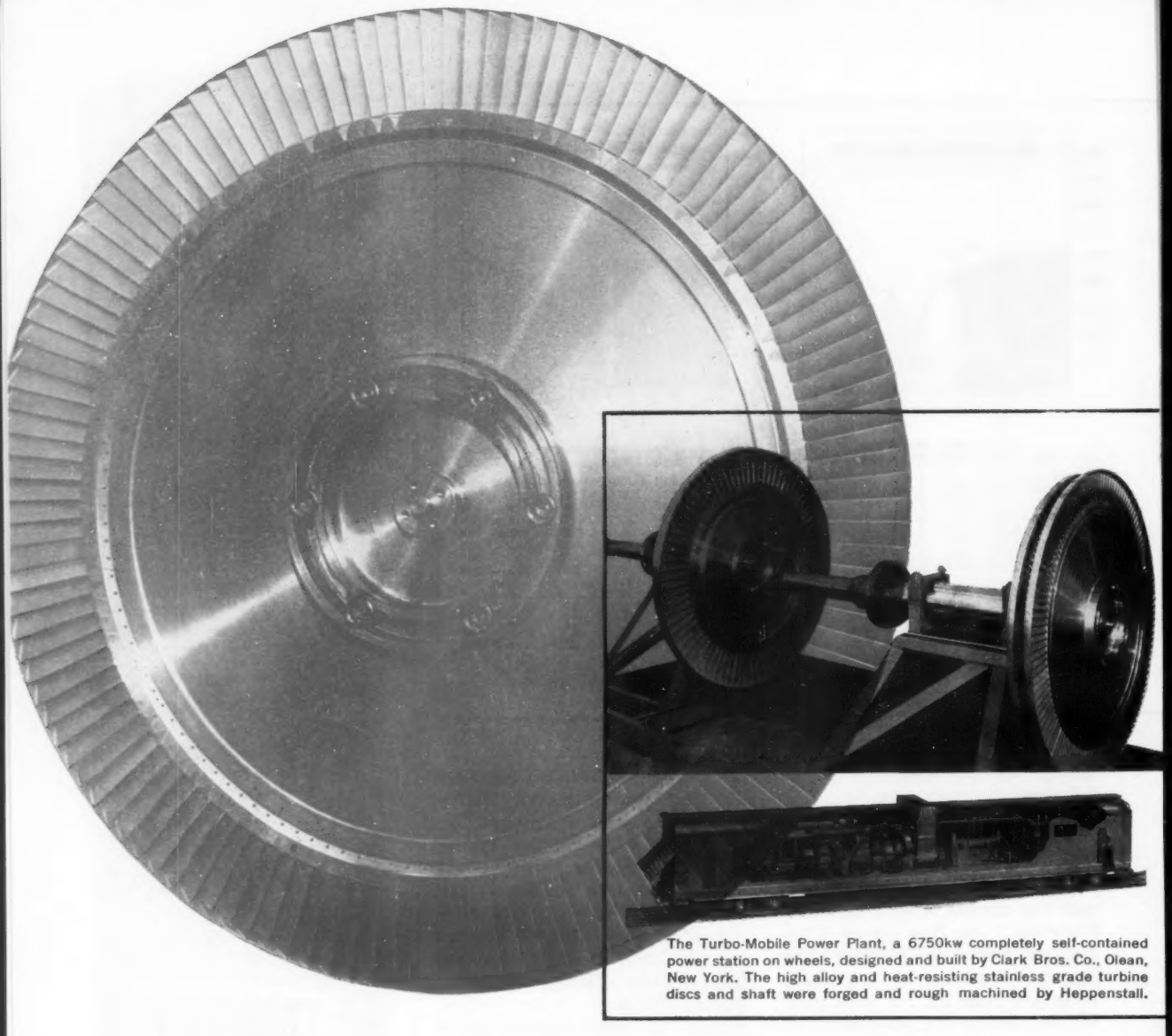

The Turbo-Mobile Power Plant, a 6750kw completely self-contained power station on wheels, designed and built by Clark Bros. Co., Olean, New York. The high alloy and heat-resisting stainless grade turbine discs and shaft were forged and rough machined by Heppenstall.

Heppenstall Forgings add reliability to Clark Power Plant Gas Turbine discs

Ingenious design and engineering have solved the problem of rapid restoration of power following natural disasters and war damage . . . or temporary power for fast growing residential or industrial areas. A Clark 6750kw gas turbine power plant can now roll in at normal rail speeds and put power on the line in the little time required to connect fuel and power outlet lines. It *must* be dependable, that's why the turbine discs used in driving the axial compressor and generator are Heppenstall Forgings.

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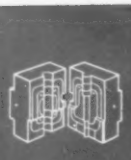
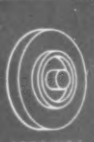
For the full story of how Heppenstall Forgings can build quality and performance into *your* product . . . and your production machines . . . contact your Heppenstall Company Representative.


DIE BLOCKS

TONGS

KNIVES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RINGS

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GEORGE KONKOL
Sylvania Electric post

CLAYTON L. HEINTZ
Cooper Alloy div. sales mgr.

ARTHUR W. STORM
Surface Combustion post

ROBERT L. BOBO
Federal Pacific gen. sales mgr.

George Konkol fills the new post of manufacturing manager in charge of wire, weld and metal stamping operations for **Sylvania Electric Products Inc.**, Warren, Pa. He was manager of the wire and weld plant of Sylvania's parts division.

Clayton L. Heintz was made sales manager, valve and fitting division, **Cooper Alloy Corp.**, Hillside, N. J. **Robert L. Cohen** was made assistant sales manager, foundry products division; **Joseph L. Victorine**, assistant sales manager, valve and fitting division.

Jack G. Dorn was made assistant to director of purchases, **Clearing Machine Corp.**, Chicago, division of U.S. Industries Inc. He was assistant to the president of U.S. Industries.

John S. Kuney was named purchasing agent for **Westinghouse Electric Corp.'s** new distribution transformer plant now under construction at Athens, Ga.

William W. Jones was made administrative assistant to vice president-sales, **Jones & Laughlin Steel Corp.**, Pittsburgh.

J. L. Montgomery was named assistant manager, steel plants equipment department, **Blaw-Knox Co.**, Pittsburgh. He succeeds **R. B. Groetzinger**, retired.

Richard K. Neidrauer was made director of purchases and metal trader of **Harry Fox Metal Co.**, Buffalo.

Arthur W. Storm was made chief engineer for the new pelletizing division of **Surface Combustion Corp.**, Toledo, O. He was with Erie Mining Co.

Cooper - Bessemer Corp., Mt. Vernon, O., appointed **Grant C. Woodard** general sales manager and elected **Robert F. Lay** vice president and assistant general manager.

Charles A. Faist was named chief metallurgist at **Burnside Steel Foundry Co.**, Chicago.

Nils Lindstrom was made superintendent, tool division, **Moore Special Tool Co. Inc.**, Bridgeport, Conn. He succeeds **William D. Angell**, retired.

Eugene V. Gustavson, former administrative engineer for Lockheed Aircraft Corp., was named director of engineering for **Aeronca Mfg. Corp.**, Middletown, O.

Martin Braun was made general purchasing agent for **Heil Co.**, Milwaukee. He succeeds **Walter Lohman**, resigned.

Clemson Bros. Inc., Middletown, N. Y., appointed **R. C. Griggs** general superintendent; **Joseph A. Schrade**, products manager; **Bernhard Blikstad**, purchasing agent to replace the late **Fred J. Hodge.**

Crucible Steel Co. of America, Pittsburgh, appointed **J. A. Scanlon** acting product manager, agricultural sales division, succeeding **H. E. Morison**, resigned.

Robert L. Bobo was appointed general sales manager, **Federal Pacific Electric Co.**, Newark, N. J. He was Great Lakes regional sales manager at Cleveland. **Leonard Shelly**, in charge of the western sales region at San Francisco, was elected a vice president.

John H. Greenaway Jr. was promoted to manager of operations for all plants of **Johnson Steel & Wire Co. Inc.**, Worcester, Mass. Formerly works manager at the headquarters plant in Worcester, he will also direct operations at plants in Akron and Los Angeles.

George Morton, president of Ferro Cast Corp., Santa Monica, Calif., was appointed general manager in charge of operations at **Pressed Metals of America Inc.**, Port Huron, Mich. Negotiations to merge Ferro Cast Corp. into Pressed Metals are in process.

James A. Roemer, president of Mallory-Sharon Titanium Corp., Niles, O., was elected president of **Reactive Metals Inc.**, formed recently by Mallory-Sharon and the U.S.I. Division of National Distillers & Chemical Corp. Chairman of Reactive Metals is **John E. Bierwirth**, president of National Distillers.

C. J. Niles was named manager of the Milwaukee producing division, **Cherry-Burrell Corp.**

Paul R. Shawver was named manager of **Square D Co.'s** Cedar Rapids, Iowa, plant. He was assistant to the vice president of

A. S. MARVIN
American Bridge chief eng.

AVERY WILSON
Maytag purchasing post

G. J. WILSON
Milton Roy plant mgr.

JAMES C. MABE
Chicago Pneumatic Tool v. p.

the distribution equipment division in Detroit. Effective July 15, he succeeds **C. Howard Brittenham** at Cedar Rapids.

A. S. Marvin was made chief engineer, **American Bridge Division**, U.S. Steel Corp., Pittsburgh. He succeeds **C. E. Webb**, retired. Mr. Marvin was assistant chief engineer-contracts.

Dr. Francis J. Shortsleeve was made assistant director of research, metals research laboratories, **Electro Metallurgical Co.**, division of Union Carbide Corp. He is at Niagara Falls, N.Y.

Dr. James A. Krumhansl was named associate director, Parma Research Laboratories, **National Carbon Co.**, division of Union Carbide Corp., at Parma, O.

Willis R. Ramsay joined **North American Refractories Co.**, Cleveland, as assistant to the president. He was with Jones & Laughlin Steel Corp.

Robert R. Mawson was made sales manager for transducer products, a new post at **Consolidated Electrodynamics Corp.**, Pasadena, Calif.

Sid Mitwol was made Detroit office manager of **Sel-Rex Corp.** He was product sales manager for the rectifier division.

Joseph P. Costigan was made general manager of **American Machine & Foundry Co.'s** Cheektowaga, N. Y., plant. **Douglas H. Smith** was made assistant general manager. **Joseph R. Glownia** fills the new post of director of material.

Avery Wilson was promoted to buyer of production materials in the purchasing department of **Maytag Co.**, Newton, Iowa. He replaces **Frank Steinhoff**, resigned. **Wendell E. Brown** succeeds Mr. Wilson as assistant buyer.

Milton Roy Co., Philadelphia, appointed **G. J. Wilson** general manager of its Florida plant, recently opened at 6301 49th St. N., St. Petersburg, Fla. Formerly assistant to the president, he is replaced by **John A. Mitchell Jr. Milton R. Sheen** was made manufacturing manager of the new plant. **George W. Schneider** was made manager of research and development.

Dewey A. White was made regional sales manager, covering Birmingham, New Orleans and Dallas districts for **Okonite Co. J. G. Wicks** was made regional sales manager, eastern districts.

Homer S. Myers fills the new post of vice president - marketing at **Tracerlab Inc.**, Waltham, Mass.

Wheeling Steel Corp., Wheeling, W. Va., appointed **V. C. Dollman** assistant manager, tubular sales division; **J. C. Mallory**, Wheeling district sales manager succeeding Mr. Dollman; **J. F. Macaulay**, a salesman in the New York office, succeeding Mr. Mallory.

Earl D. Hoyt was made Cleveland regional manager for **Lamson Corp.**

Donald Strachan was made assistant to the president of **Lee Rubber & Tire Corp.**, Youngstown. He was eastern sales manager for the Republic Rubber Division.

James C. Mabe, manager of plant operations, was elected a vice president of **Chicago Pneumatic Tool Co.** He continues headquarters at the home office in New York.

W. G. Dahl was named eastern regional sales manager, **Latrobe Steel Co.**, with headquarters at Hartford, Conn. **L. M. Teich**, Philadelphia district manager, transfers to the Hartford branch as district manager. **J. G. Goodrich** was made district manager at Philadelphia.

Russell L. Sylvester, chief engineer of Rockwell Mfg. Co.'s central valve research and development department, was promoted to engineering executive assistant of Rockwell's newly acquired **Republic Flow Meters Co.**, Chicago.

Nuclear Systems Division, **Budd Co.**, Philadelphia, appointed: **Aaron V. Kelley**, sales manager, West Coast, with headquarters in San Francisco; **Martin L. Dion**, sales manager, southwestern district, with headquarters in Dallas; **Dr. William E. Parker**, manager of product research at Philadelphia.

M. A. Haberman was made manager of the plant office of **Eutectic Welding Alloys Co. of Canada Ltd.**, Montreal, Que.

Everett S. Hoff was made manager, Summerill Stainless Tube Division, **Columbia Steel & Shafting Co.**, Pittsburgh. **E. Joseph Miller** was made sales manager, Summerill Tube Division.

A. R. Buckles was appointed vice president-production for **Magna**

i'so [Greek, *isos*, equal]

i'so-brite® [Proprietary Name] Plating addition agents which produce plating of uniform brightness.

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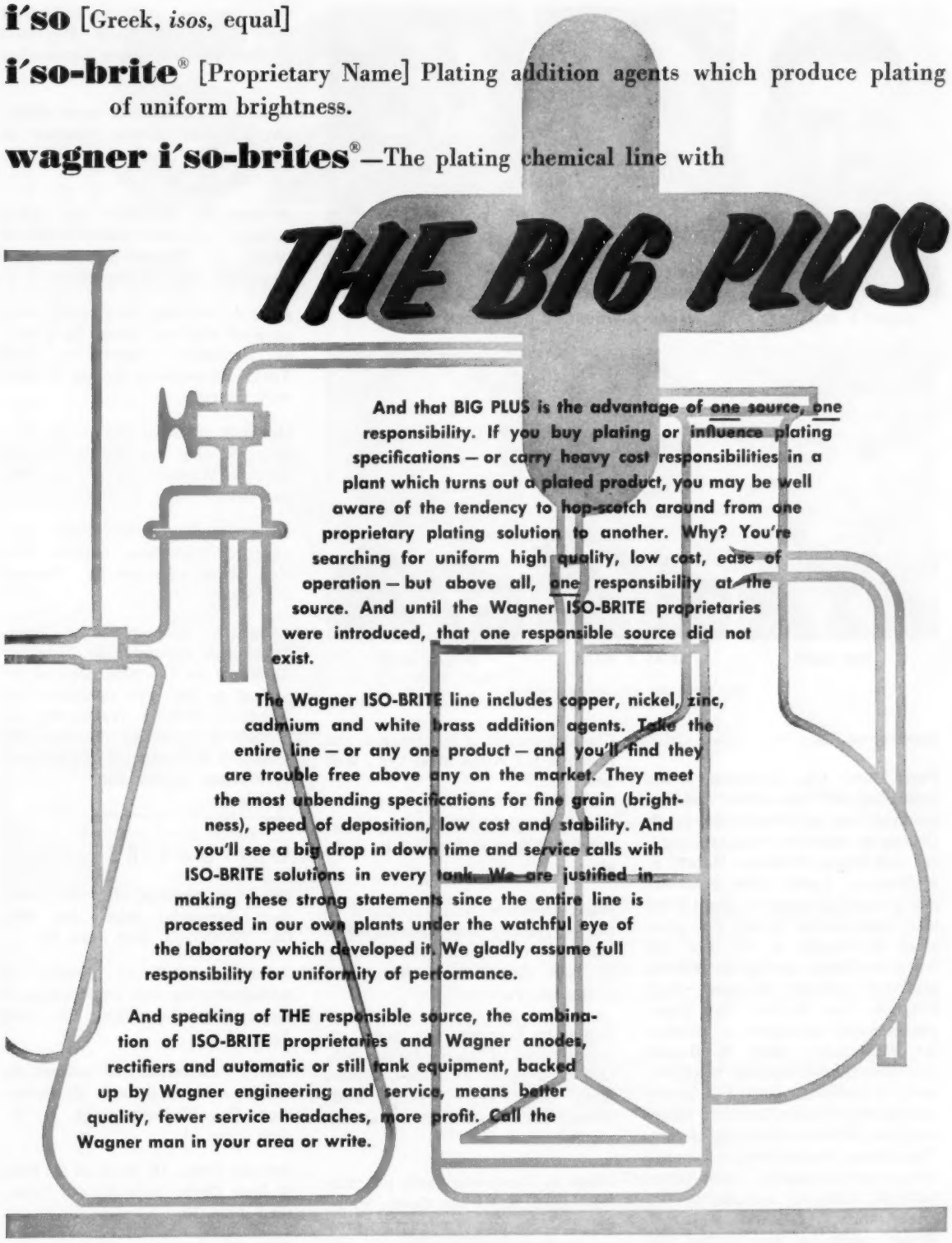

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Ford Motor Co. executive promotions

Electronics Co., Inglewood, Calif.

Ford Motor Co., Dearborn, Mich., promoted six executives and announced the retirement of **L. D. Crusoe** as executive vice president-car and truck divisions: **Robert S. McNamara**, former vice president and general manager of Ford Division, was elected group vice president in charge of the car and truck divisions. **James O. Wright**, assistant general manager, Ford Division, was elected vice president-general manager to succeed Mr. McNamara. **John S. Bugas**, vice president-industrial relations, was, in addition, elected a group vice president, with the Ford International Division reporting to him. **Tom Lilley** was elected vice president-general manager, Ford International Division, succeeding the late **Arthur J. Wieland. Arjay R. Miller**, controller, was elected vice president-controller. **Earl G. Ward**, purchasing director, was elected vice president-purchasing.

B. M. Hamilton was made chief metallurgical engineer; **Dr. R. Clark**, manager of laboratories and research for **Atlas Steel Ltd.**, Welland, Ont.

Bathey Mfg. Co., Plymouth, Mich., appointed **Glen R. Steele** sales manager.

Wudi Dreifuss was appointed to the purchasing and administrative staff of the nonferrous division at **Tube City Iron & Metal Co.**, Glassport, Pa.

Benjamin Torrison was made superintendent of the production control department at **Allis-Chalmers Mfg. Co.'s** Terre Haute, Ind., Works. He succeeds **John Rehorst**, resigned.

Hugh B. Ward was made purchasing agent of **Kiljian Corp.**, Philadelphia. He was construction project engineer.

R. H. Goodwin was made general sales manager, **Electronic Wire & Cable Corp.**, Burbank, Calif.

James C. Chapin was made general sales manager at **Darco Industries Inc.**, El Segundo, Calif. **Raymond J. Desbiens** was made purchasing director.

Charles E. Smith was made assistant national service director of **Robertshaw-Fulton Controls Co.**, Greensburg, Pa.

William W. Martenis was made manager of semiconductor operations at **Minneapolis-Honeywell Regulator Co.**, Minneapolis.

John J. Jennings was made manager of **National Lead Co.'s** metal purchases department, New York. He succeeds **Ernest R. Dondorf**, retired.

Hollis W. Norman was named manager of the Tonawanda, N. Y., plant of **Western Electric Co. Inc.**, succeeding **John D. Burlie.**

Joseph R. Carter was made manager of operations, eastern division, **Wyman-Gordon Co.**, Worcester, Mass.

Allegheny Ludlum Steel Corp., Pittsburgh, appointed **Dr. Theodore T. Magel** to the new post of assistant to the vice president and technical director, responsible for nuclear development. He was vice president in charge of development at Nuclear Metals Inc.

OBITUARIES...

Oliver J. Neslage, 64, vice president-commercial sales, **Joy Mfg. Co.**, Pittsburgh, died June 19.

Ronald C. Hoff, 47, director of manufacturing and engineering at **Eriez Mfg. Co.**, Erie, Pa., died June 14.

Henry P. Kirchner, 67, retired executive vice president, **Carborundum Co.**, Niagara Falls, N. Y., died June 14.

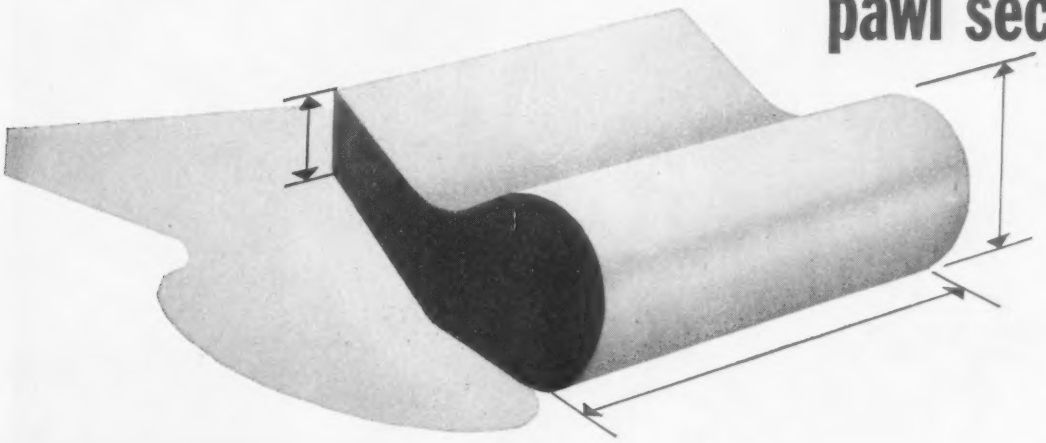
Samuel Stein, 79, head of **S. Stein & Sons Corp.**, New Haven, Conn., died June 10.

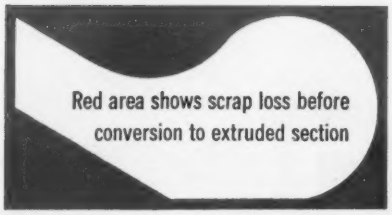
Benjamin I. Cohen, 67, one of the owners of **Louis Cohen & Son**, Wilkes-Barre, Pa., died June 12.

William J. Cox, 44, president, **Quadriga Mfg. Co.**, Chicago, died June 15.

52% saving

reported with J&L hot extruded cold drawn pawl section





This pawl was previously milled from a ¾" x 1½" hot rolled oil hardening tool steel. Conversion to a cold drawn extruded section cut cost from 45¢ to 22¢ per part.

Here's how extruded sections can cut your cost:

1. Eliminate machining and finishing operations.
2. Reduce scrap losses almost to zero.
3. Eliminate cost of casting and forging intricate sections.
4. Reduce inventories because extrusions are quickly available.

Investigate this new production technique for your shape profiles—within present limits of a design which can be inscribed in a three-inch circle. Available in a wide range of carbon and alloy steels. For specialty alloy and tool steels, submit inquiry. Get complete details by writing to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

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Leading Auto Manufacturer Selects
6 Greenlee Transfer Machines For
V-8 Engine Block Precision Machining Line
The entire installation has 127 stations and a machined block comes off the line at each cycle. This first unit drills and reams locating holes, mills main bearings to width; mills lock slots, oil seal and slinger grooves, fuel pump and filter pads and rough bores cylinders. It also has a gauging station to check locating holes, a reject station and three turnover stations, the last of which positions the block for the next machine.
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Broadens Research

Air Reduction breaks ground for $500,000 addition to its research laboratories

AIR REDUCTION Co. Inc., New York, is building a $500,000 addition to its central research laboratories at Murray Hill, N. J. It will be completed by the end of this year and will house new chemical research facilities.

Extensive research programs are conducted at Murray Hill in chemistry, metallurgy and cryogenics. The major fields of chemical research and development in which the laboratory is presently engaged are: Fine organic chemicals, primary intermediates for plastics and resins, plastics research, applications research and analytical services.

Metallurgy—Metallurgical phases include arc welding research, development of treating agents for use in the iron and steel industry, product development in the inorganic field and development of customer-use processes. Process engineering, pilot plant activity and works-scale testing of products and processes in customers' plants also are carried on.

The five major categories covering the field of active research and development in the metallurgical field are: Welding; process and physical metallurgy; combustion, heat transfer and fluid flow; electrothermics; and electronic control and instrumentation.

Cryogenic research activities include development and testing of equipment for handling liquefied gases, development of processes for the more efficient separation of gases by liquefaction techniques and the conduct of experiments to secure design data for low temperature equipment and processes.

Refractories Firm Expands

J. H. France Refractories Co., Snow Shoe, Pa., will modernize and expand its facilities at an estimated cost of $250,000. The program includes the erection of expanded grinding facilities, new electrically vibrating grain sizing screens and additional machinery for the increased production of high temperature mortars and refractory castables. Productive capacity will be increased between 50 and 60 per cent.

Electro Refractories Expands

Electro Refractories & Abrasives Corp., Buffalo, is erecting an 8000 sq-ft building to provide additional facilities for special refractories.

Builds Test Laboratory

American Laboratories, a division of American Electronics Inc., Los Angeles, is building an environmental test laboratory in Fullerton, Calif.

Selects Titanium Plant Site

Allied-Kennecott Titanium Corp., Syracuse, N. Y., has selected Wilmington, N. C., as the site for its initial multimillion dollar plant to produce titanium forgings and billets.

Expansion Program Progresses

Substantial progress is being made on the $30-million modernization program at Wheeling Steel Corp.'s Yorkville (O.) Works, says W. A. Steele, vice president-operations. Work on foundations for the 48-in. five-stand tandem mill for cold reducing hot strip is approaching completion. Mill housings for the temper rolling mill have been placed in position and electrical and piping work is progressing. The mill will process wider strip in coils. The first phase of the new box annealing capacity is in operation. Older style annealing furnaces will be replaced eventually. All of the new equipment for the machine shop has been installed. Construction of the new roll shop building is completed and in service with a large part of the equipment installed.

Other major projects of this program, still in the preliminary phases, include: A new electrolytic cleaning and scrubbing line and modernization of two existing lines; hot strip pickling equipment for removal of mill oxide prior to cold reducing operations; a new side trimming and recoiling line; and installation of equipment to produce tin plate in coils.

Roebling Producing New Cable

John A. Roebling's Sons Corp., Trenton, N. J., is completing a $2.5-million installation of production facilities for high voltage power cable and other electrical wire products. The Electrical Wire Division has initiated production of low pressure gas-filled cable. Roebling is a subsidiary of Colorado Fuel & Iron Corp., Denver.

Globe Industries To Build

Globe Industries Inc., maker of motors and motor products, will build a $1.5-million plant in Dayton, O. The 100,000 sq-ft building will house manufacturing and office facilities.

Electrodynamics Opens Offices

Consolidated Electrodynamics Corp., Pasadena, Calif., established district sales offices in Orlando, Fla. (under the managership of R. C. Wynne) and in St. Louis (under the managership of J. W. Ashley). The company moved its Los Angeles district office from Pasadena to Beverly Hills.

Forms Molding Machinery Firm

Mercury Industries Inc., Hillsdale, N. J., and Thomas M. Dodds organized Mercury Molding Machinery Inc. It will specialize in the manufacture of machinery used to mold vinyl plastisols and related plastics. Mercury Industries will continue to make auxiliary equipment for the vinyl plastisol molding industry.

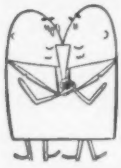
E. F. Houghton Expanding

E. F. Houghton & Co., Philadelphia, is expanding its manufacturing facilities in Detroit, more than doubling the size of the plant. The company plans to manufacture practically the same oil and chemical specialty line in Detroit as it does in Philadelphia, Chicago and San Francisco.

Whitehead Opens Warehouse

To facilitate distribution of nonferrous and corrosion resistant metals to customers in Connecticut and western Massachusets, White-

head Metal Products Co., New York, opened a 34,100 sq-ft warehouse in Windsor, Conn. Joseph C. Simmons, formerly manager of Whitehead's New Haven, Conn., plant, heads the new operation.



CONSOLIDATIONS

Standard Pressed Steel Co., Jenkintown, Pa., has entered the steel office furniture field through the purchase of **Columbia Steel Equipment Co. Inc.**, Ft. Washington, Pa. SPS produces precision industrial and aircraft fasteners and related items, as well as steel shop equipment.

Wood Shovel & Tool Co., Piqua, O., acquired the Geyer Mfg. Co., Rock Falls, Ill., maker of garden cultivators, and garden hand tools.

Capitol Metals Co. and **All American Steel & Metal Co.** merged. The new firm, Capitol Metals Co. Inc., will distribute sheet steel, structural shapes and plates from its warehouse at 2222 S. Grand Ave., Los Angeles. The firm will build a $250,000 plant in Vernon, Calif. Officers are: President, N. J. Reese; vice presidents, D. J. Eget and Robert Friedland; secretary-treasurer, Sam Narens.

ASSOCIATIONS

Earl Sparks has retired as secretary of the **Metal Manufacturers' Association**, Philadelphia, after serving the organization for 47 years. W. R. Chapel succeeds him.

George E. Lawrence has been appointed manager of the **Scientific Apparatus Makers Association's** Washington office, effective Aug. 1.

Fred L. Plummer has been appointed national secretary of the **American Welding Society**, New York.

Machinery & Allied Products Institute, Washington, re-elected these officers: President, Charles W. Stewart, that city; treasurer, A. S. Armstrong, Cleveland Twist Drill Co., Cleveland; research director, George Terborgh, Washington; vice presidents: R. E. Friend, Nordberg Mfg. Co., Milwaukee; Alfred Iddles, Babcock & Wilcox Co., New York; Morehead Patterson, American Machine & Foundry Co., New York; T. H. West, Draper Corp., Hopedale, Mass.

Raymond P. Tarbell of Scott-Tarbell Inc., Cleveland, was elected president of the **National Welding Supply Association**, Philadelphia.

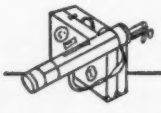
NEW ADDRESSES

Bristol Co., Waterbury, Conn., moved its Pittsburgh district office to 2250 Noblestown Road, that city. District manager is L. B. Lumpkin.

Link-Belt Co., Chicago, is moving its New York district office to 530 Fifth Ave., New York 36, N. Y. H. D. Alexander is district manager. The firm's New York export offices remain at 233 Broadway.

All inquiries for **Lamson Mobilift Corp.** should be sent to William Warner, 825 S.E. Main St., Portland, Oreg. The sales promotion program will be directed from the Portland plant after July 1.

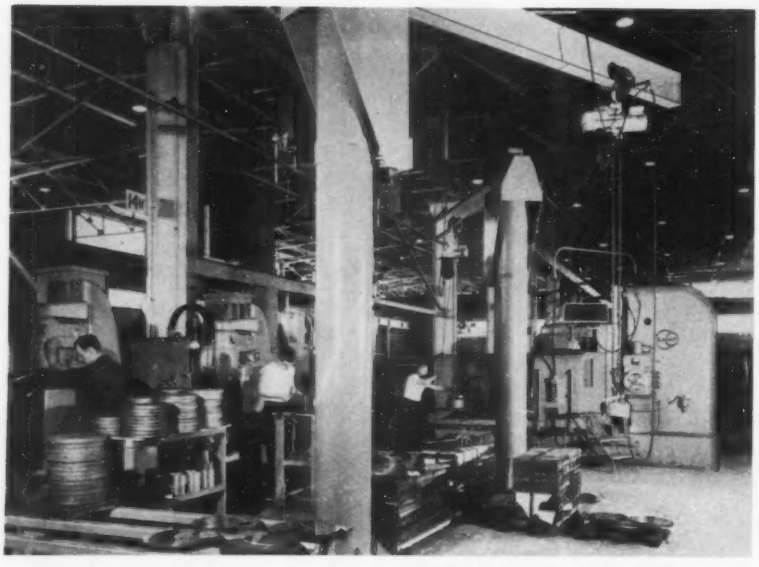
American Screen Products Co. moved its general offices to 61 E. North Ave., Northlake (Chicago), Ill. The firm makes aluminum screens and screen and storm sash components at its main plant in Chatsworth, Ill., and at its El Monte, Calif., plant. A subsidiary, Metal Screen Corp., occupies ASP's former main plant in Miami, Fla.



VACATIONS

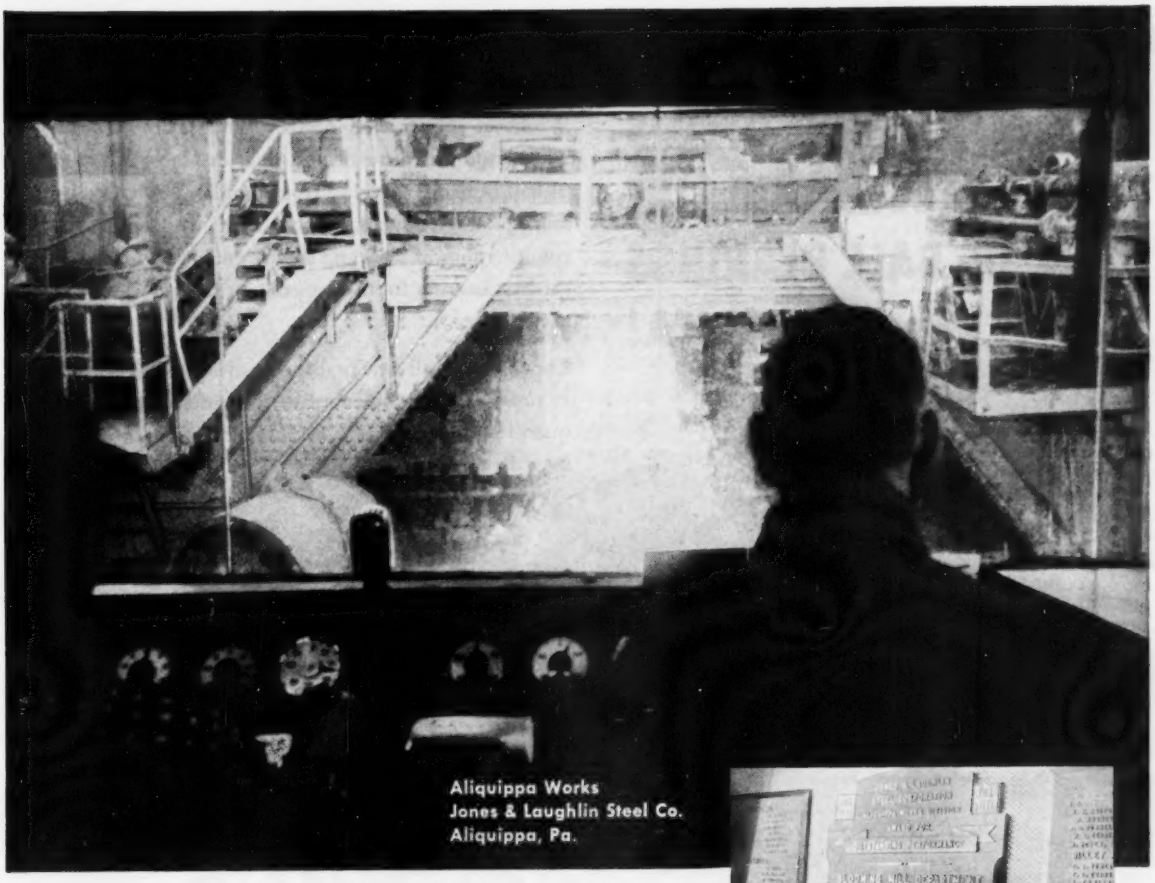
General Motors Corp.'s Buick Motor Division, Flint, Mich., will suspend manufacturing operations July 3 to 15 for its annual inventory. "Inventory is being taken at this time to facilitate the annual model change-over this fall," says E. T. Ragsdale, general manager of Buick and vice president of the corporation.

Waldes Kohinoor Inc., maker of retaining rings, grooving tools and other products, Long Island City, N. Y., will close from July 22 through Aug. 2. Sales, order and shipping departments will function on a limited basis.



Chicago Warehouse Offers New Plate Grinding Service

Typical of services offered by A. M. Castle & Co.'s new warehouse in Franklin Park, Ill., is grinding on both sides of plate to provide a smooth surface for final product assembly. This latest Castle service is done on Blanchard grinders; two 48-in. units on the left and one 96-in. grinder in the background



Aliquippa Works
Jones & Laughlin Steel Co.
Aliquippa, Pa.

An ingot a minute!

and never a lubrication failure with Cities Service EP-21 Lubricant!

At Jones & Laughlin's Aliquippa Blooming Mill, they believe in production with a capital "P"!

Not only does J&L's Aliquippa Mill hold the world's record for ingots rolled in an eight hour turn (576), but they've set a year-in, year-out average of an ingot per minute!

How do they sustain this production for such long periods?

One answer lies in their modern, 44-inch, two-high reversing unit, powered by four 3000 h. p. motors arranged in tandem twin drive.

Another can be found in their lubricant . . . Cities Service EP-21.

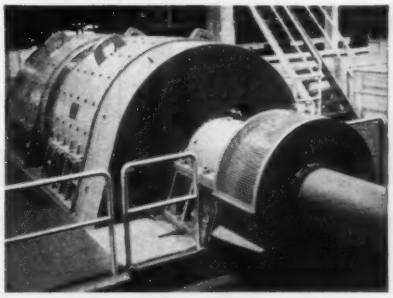
Used on main bearings, manipulator slides and window liners, Cities Service EP-21 and its superior additives provide an unusually tough film . . . tough enough to stand the highest pressures, the greatest shock loads with no loss of lubrication, no danger of rust or corrosion.

Yes, Jones & Laughlin is pleased with Cities Service lubricants! You'll feel the same when Cities Service goes to work in your operation. Talk with your Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Award for 8-Hour Turn Record is displayed proudly outside mill. J&L smashed previous record by 38 ingots—rolled up new total of 576! Year-in and year-out, the plant averages an ingot a minute, with flawless lubrication provided by Cities Service.



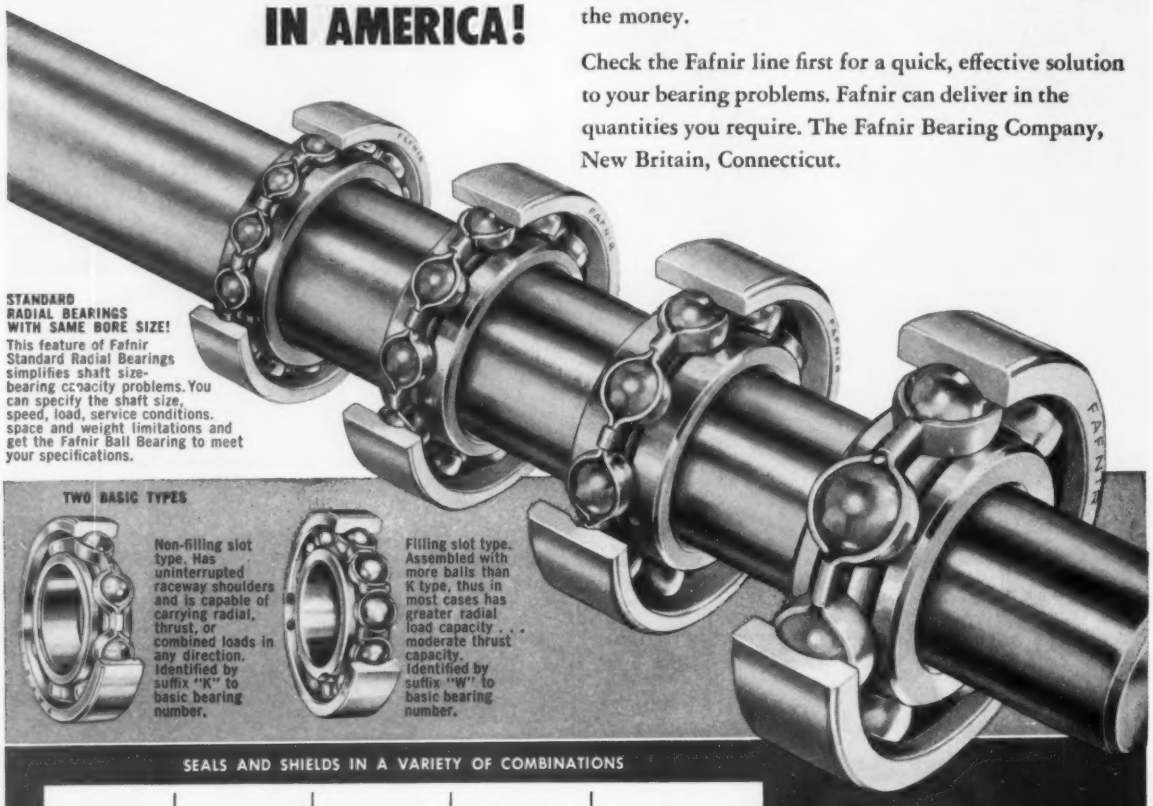
Four 3000 h.p. Motors power the blooming mill at J&L's Aliquippa Works. These are 70 to 140 rpm, double-armature units arranged in tandem twin drive. At 70 rpm, they can reverse in under a second. Equally flexible is the mill's lubricant—Cities Service EP-21.

For the most effective answers to your bearing problems...

FAFNIR OFFERS THE MOST COMPLETE LINE OF BALL BEARINGS IN AMERICA!

Whatever your bearing needs, your best bet is Fafnir. The reason . . . Fafnir makes America's most complete line of ball bearings, ranging from standard radial to custom-made jet engine types. Various tolerances and combinations of seals and shields enable Fafnir to supply the best bearing for the purpose — the *most* bearing for the money.

Check the Fafnir line first for a quick, effective solution to your bearing problems. Fafnir can deliver in the quantities you require. The Fafnir Bearing Company, New Britain, Connecticut.



STANDARD RADIAL BEARINGS WITH SAME BORE SIZE!
This feature of Fafnir Standard Radial Bearings simplifies shaft size-bearing capacity problems. You can specify the shaft size, speed, load, service conditions, space and weight limitations and get the Fafnir Ball Bearing to meet your specifications.

TWO BASIC TYPES

Non-filling slot type. Has uninterrupted raceway shoulders and is capable of carrying radial, thrust, or combined loads in any direction. Identified by suffix "K" to basic bearing number.

Filling slot type. Assembled with more balls than K type, thus in most cases has greater radial load capacity . . . moderate thrust capacity. Identified by suffix "W" to basic bearing number.

SEALS AND SHIELDS IN A VARIETY OF COMBINATIONS

1 Shield

1 Felt Seal and Shield

1 Mechani-Seal and Shield

1 Plya-Seal

Wide Type Bearing with Plya-Seals

2 Shields

2 Felt Seals

2 Mechani-Seals

2 Plya-Seals

Wide Type Bearing with Mechani-Seals

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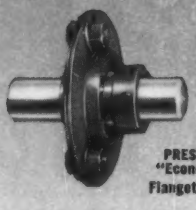
A COMPLETE LINE OF HOUSED UNITS including:

CAST IRON PILLOW BLOCKS
LAK illustrated

CAST IRON FLANGE CARTRIDGES
LCJ illustrated



PRESSED STEEL "Economy" UNITS
Flangette illustrated

STEEL

July 1, 1957

Technical Outlook

DUCTILE IRON— Results of research on ductile iron revealed at the annual meeting of the ASTM point the way to improved elevated temperature properties. R. D. Schelleng of International Nickel Co.'s laboratory, Bayonne, N.J., reported that additions of molybdenum and copper greatly enhance creep resistance. An increase in phosphorus content (not over 0.1 per cent) is also beneficial. The work showed that the creep resistance of austenitic ductile irons containing 20 to 30 per cent nickel and 2 to 3 per cent chromium is much better than that of the ferritic types.

MORE ASTM NOTES— H. R. Neifert and Oscar J. Horger, Timken Roller Bearing Co., Canton, O., presented data which showed that chromium plating may help to raise the stress levels at which fatigue cracks initiate. Rotating bending fatigue tests were made on 0.50 per cent plain carbon steel shaft forgings having a press fitted outer disc member. The normalized and tempered forgings were 9 7/16-in. in diameter. The disc seats of some assemblies were chrome plated.

PRESS SPEED-UP— Development engineers at E. W. Bliss Co., Canton, O., foresee inclinable presses with speeds of 3000 to 4000 strokes a minute. They say such speeds will be brought about by the use of electronically controlled, electromagnetic drives, heavier frames and lighter reciprocating parts.

MOLY PROGRESS— In his Gillett Memorial lecture (sponsored by ASTM and Battelle), Alvin J. Herzig, president, Climax Molybdenum Co. of Michigan, Detroit, predicted that molybdenum alloys would extend the application range of the metallic state to 3000°F. He described the 0.5 per cent titanium-molybdenum alloy as a breakthrough for a hot strength material. Fabrication is the biggest deterrent to the application of such alloys, he said. Progress is being made on coatings to prevent oxidation. Most promising are: 1. Al-Cr-Si sprayed coatings. 2. Cr and Cr-Ni electroplated. 3. Inconel cladding.

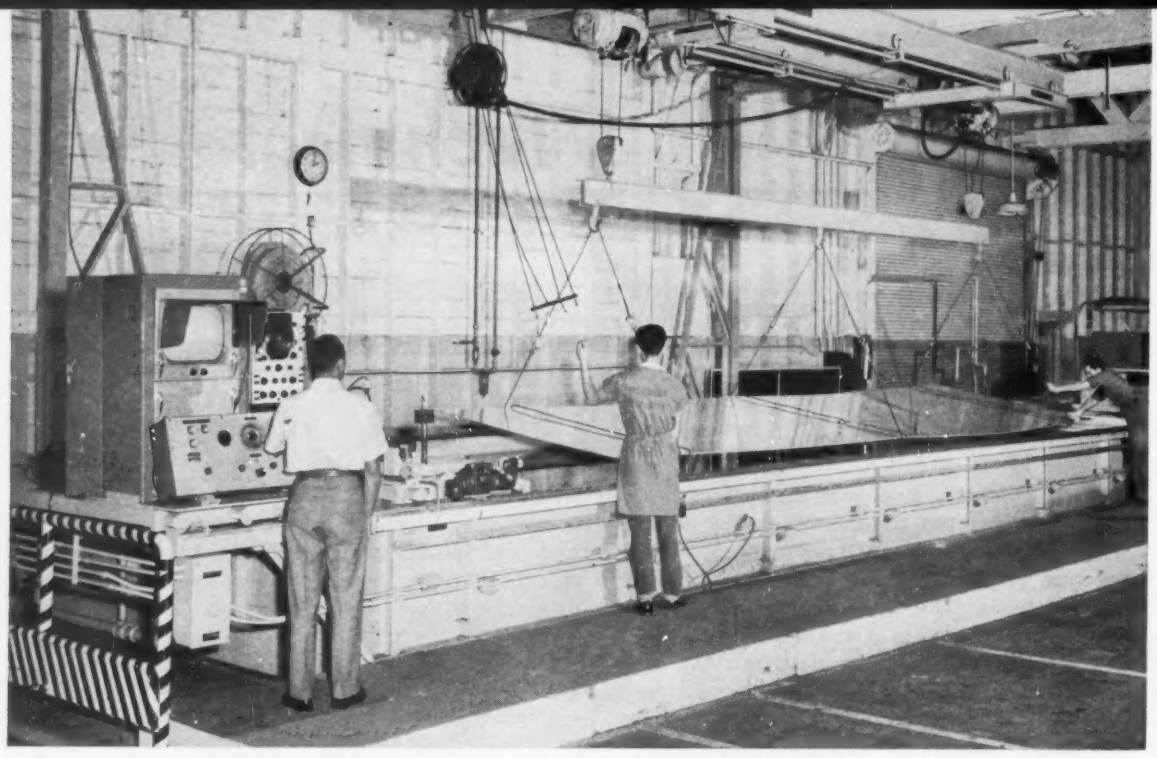
STREAMLINED PALLET— Yale & Towne, Philadelphia, has been trying aluminum sheets for pallets. They can be used several times. Results so far show cost improvement over single sheets of corrugated paperboard.

COLOR MATCH— Eclipse Air Brush Co., Newark, N. J., has introduced a portable machine to spray color test panels for precise color matching. The machine controls panel speed, gun distance, angle and height. It's supposed to eliminate the human factor.

ALUMINUM FOAM— It looks like bread, has extreme rigidity and can be sawed and nailed like wood, says Bjorksten Research Laboratories Inc., Madison, Wis. (Dow is doing the same thing with magnesium.) In perfecting the process, Bjorksten is shooting for a product that can be several feet wide, 3 or 4 in. thick and as long as the customer wants it. (The material weighs less than 15 lb per cu ft.) Bubble size ranges up to ¼-in. and can be controlled. Metal hydrides are the foaming agents. Dr. Johan Bjorksten, president of the firm, believes the process can be applied to steel.

POROSIMETER— The size and number of pores in a material many times determine its quality and performance, particularly in uses like filters and battery separator plates. American Instrument Co. Inc., Silver Spring, Md., has developed a machine, called a Porosimeter, that can make such a pore structure analysis. Any material that has pores can be analyzed.

Metalworking Outlook—p. 27 *Market Outlook—p. 97*



The ultrasonic inspection tank at Douglas Aircraft can handle a 10 x 40 ft plate. Inspectors are lowering a wing skin for the A3D carrier based jet bomber

Sound 'Sees' Rejects Before They Happen

MEMO TO MANAGEMENT

Here's another way you can cut costs: Discover internal flaws in materials before you invest machining time and money in them. Douglas Aircraft, for example, reports it saved $472,030 that way in 1956. Its breakdown: Potential cost of finished parts, $754,261. Savings based on assumption that flaw would not show up until parts were 80 per cent completed, $603,409. Cost of inspection (ultrasonic method), $36,663. Credits for rejected material, $94,716.

ULTRASONIC testing was used to get "inside" information on raw materials worth close to $5 million at Douglas Aircraft Co. Inc., El Segundo, Calif., last year.

The company says the value of the aluminum and steel it rejected at this stage came to $138,055. Translating that sum into a dollar percentage, the rejection figure was 2.78 per cent.

If not detected ultrasonically, many of the defects might have been found by Magnaflux or x-ray during in-process inspection, but only after considerable machining had been done, explains H. J. McFaul, assistant chief inspector.

To point up this relatively new area of cost reduction, STEEL presents this roundup article. Particular emphasis is placed on the ultrasonic inspection of steel.

Materials—Most ultrasonic testing procedures have been developed in the inspection of aluminum. Inspection of steel involves some new problems. The major difference, says Jack Folz, supervisor at the Ultrasonic Testing & Research Laboratory, Van Nuys, Calif., is that steel is harder to get through than the aluminum alloys. Another difference: Since steel has more types than aluminum, steel probably has more kinds of defects.

Steel alloys always have been used for certain aircraft parts—landing gear, fire walls, arresting hooks, catapult hooks. Tomorrow's

aircraft, traveling at hypersonic speeds, will need a higher strength material than aluminum. In many cases, it will be steel.

The airframe industry has proved the value of ultrasonic inspection of aluminum alloy parts, states William C. Hitt, assistant chief inspector at Douglas' Santa Monica (Calif.) division. "We feel strongly that we cannot accept a lower quality in the steels used in our aircraft and engines," he adds.

Technique—The Allison Aircraft Division of General Motors Corp., Indianapolis, inspects by the immersion method, using these basic principles for the detection of flaws:

1. Reflection of the signal from a discontinuity within the material. (Indicated by additional reflections from the ultrasonic screen.)

2. Loss of back reflection of the signal because of absorption or distribution of the signal from a discontinuity. (Indicated by a loss or reduction of the reflection from the back surface of the material.)

PRODUCTS TESTED

Flaws resulting from pipes, fingers and inclusions in tubing are cause for rejection. They will be indicated by extemporaneous pips over the loss of back reflection, explains William Jacoby of Allison's ultrasonic inspection department.

The approximate location of the flaw is established from the final position of the pip on the screen. It is more precisely located by radial examination. Welded tubing requires special techniques in evaluating the welded section because of the grain structure and inherent problems caused by welding. Acceptable passes are used for comparison.

Castings—Cracks, voids, porosity and inclusions are the main problems in castings. Hollow types are checked by individual techniques, depending on their shape.

Parts which are solid can be automatically programmed so a complete coverage can be made. Allison uses masters of the same type of material (and the same shape, if possible). Drilled holes in the masters simulate flaws of various sizes.

Problem—Certain meridian inclusions in steel which are tightly bonded to the parent metal, and have about the same density as the parent metal, will not be adequately detected by ultrasonic inspection.

"It is one of our unsolved problems," says Mr. Jacoby. "The division has been unable to develop techniques or criteria that will assure such inclusions will be found."

Weld Zone Flaws—At the Aircraft Gas Turbine Division of General Electric Co., Evendale, O., ultrasonic testing solved the problem of detecting flaws in a welded part.

In a composite wheel, made of a stainless alloy rim welded to a hub of ferrous material, a defect developed in the heat-affected zone on the rim side of the weld. Other nondestructive techniques the division tried did not detect the flaw because of its orientation in the wheel. Direction of an x-ray beam and the type of flaw it would uncover were restricted.

Ultrasonically—There were problems in ultrasonically detecting the flaw because it was adjacent to the weld area. The weld material caused the ultrasonic beam to attenuate rapidly.

Some of the scanning was getting into the weld area and some in the rim. Slight inclusions in the weld area gave spurious indications. It took a considerable amount of correlation between an x-ray made of the weld and the ultrasonic test to determine if they were rejectable indications, says Murvell J. Bratt, ultrasonics engineer.

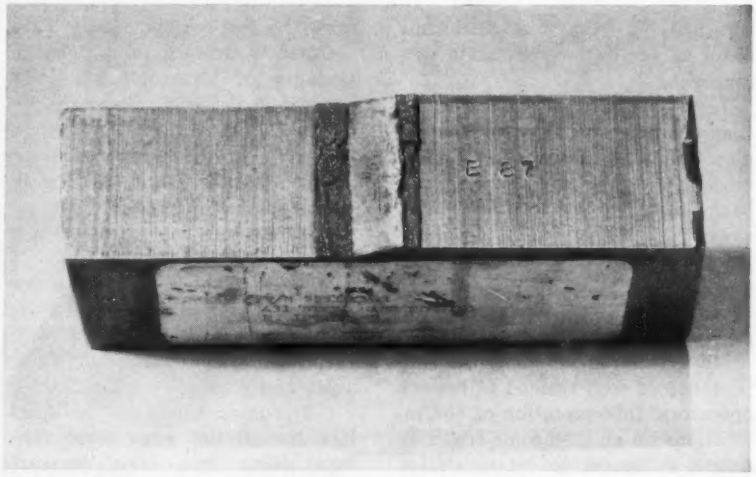
"Seeing some of the slight inclusions with ultrasound gave us the problem," he explains, "but by correlating, by determining exactly where we directed the ultrasound, we were able to detect whether it was in the weld."

Results—Using that technique, the division has located many cracks which were causing trouble in the heat-affected zone. In the development stage, this type of crack could cause the engine to go to pieces in the test cell, asserts Mr. Bratt.

During three years of ultrasonic inspection on this part, there have been no failures attributable to this defect, he says.

Nuclear Field — Another major user of ultrasonic equipment for inspection of steel is the nuclear industry. Such inspection is specified for all steel used in critical parts of nuclear equipment. Quality standards are extremely high.

A void in a 5 in. plate cost Babcock & Wilcox, Barberton, O., $70,000. Ultrasonic examination, using the longitudinal radius, failed to detect the flaw. The plate contained laminar type defects and a little more than the center third of it was dotted with sulphide inclusions. The void was located below one of the laminations which



This condition existed in 12 forged steel bars Douglas received. Failure to detect the flaws in receiving inspection could have cost $6900 in machine time

This tubing was step milled after ultrasonic indications were found and then tested magnetically. Spiral cracks can be seen which did not show up magnetically before machining

screened it from the ultrasonic beam as far as interpretation was concerned.

Tests—Babcock & Wilcox found that on heavy plates with laminar discontinuities, holes ½-in. in diameter show no difference in the basic ultrasonic pattern. However, says Frank Armstrong of the Quality Engineering Group, if you couple the shear-way technique with longitudinal testing, you can pick up a 1/16 or ⅛-in. hole easily.

Mr. Armstrong stresses the importance of well trained ultrasonic operators. Interpretation of the indications on an ultrasonic scanning screen compares to interpretation of x-ray films. An operator must understand what he sees. Otherwise, the test has no value.

Other Fields—John C. Smack, manager of ultrasonic sales, Industrial & Scientific Products Division, Curtiss-Wright Corp., Caldwell, N. J., estimates there are nearly 1300 ultrasonic testing instruments in industry. Of these, not more than 400 are in the aircraft and nuclear industries.

Most of the steel companies that produce premium steel are testing their products ultrasonically. Railroads use the method to check axles and engine driveshafts.

Ultrasonic inspection is specified for all the large rotor forgings going into high pressure, high temperature steam equipment. All high pressure steam pipe, much of which is 7 or 8 in. in diameter, must pass ultrasonic inspection.

Automotive manufacturers haven't used the method much, largely because production quantities are too large to permit 100 per cent inspection. Welded tubing used for driveshafts has been tested this way.

Much of the ultrasonic equipment in industry is being used by suppliers of steel forgings for the aircraft people. Few, if any, aircraft manufacturers will accept forgings that haven't been ultrasonically inspected.

WORK TO BE DONE

One of the problems of ultrasonically testing steel is a lack of standardization in the interpretation of results. Echo amplitude information has been available to users of ultrasonic devices since the development of the pulse echo technique. A more rapid achievement of standardization in the interpretation of results may be obtained by another approach, believes Carlton H. Hastings, scientist at Avco Mfg. Co., New York. He cites two paths:

1. A concerted attack on ultrasonic fundamentals, emphasizing the acoustic phenomenon within metal specimens and associated

with acoustic coupling. Research should pursue such problems as the acoustic impedance of various types of discontinuities and the impedance gradients involved, the relationship between size of discontinuity and frequency required to detect it, and the influence of nonhomogeneous or lumpy scattering and absorption.

2. Development of instruments providing images of discontinuities by recorder or cathode ray tube presentation. It is believed the type and size of a discontinuity can be identified this way. The resolution of imaging and scanning devices is vitally important to detection of flaws ultrasonically. Evaluation of microscopic flaws requires considerable improvement in the resolution of ultrasonic instruments.

INSTRUMENT NEEDS

Donald C. Erdman, consultant to Sperry Products Inc., Danbury, Conn., describes the ideal instrument, which could be used for both contact and immersed inspection:

1. It should be small enough to be carried by one man. It must be transportable up ladders and through access doors. Size and weight must not be too great for mounting on the bridge of a scanner.

2. The cathode ray viewing screen should be as large and bright as practical. Size is important because the screen is often many feet from the observer. Brightness is needed to overcome strong light, as from the sun when doing maintenance inspection on aircraft.

3. The instrument must be stable even though exposed to severe line voltage. During shift changes in large plants, the line voltage will often jump 10 volts. It would be best to eliminate the need for an external line voltage regulator.

4. The detector should have such special features as a flaw gate with flaw alarm, an automatic attenuation compensator and some device to aid in measuring metal thickness.

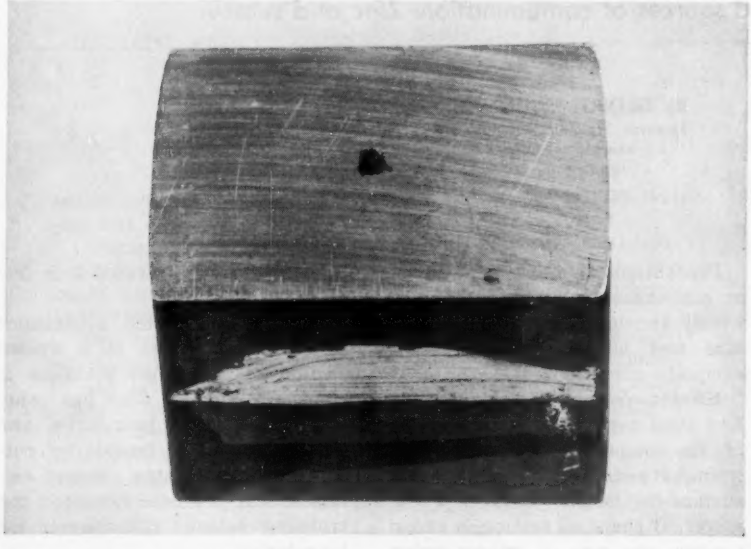
ULTRASONIC TEST DATA SHEET

DATE: _____

PART NUMBER		MATERIAL ALLOY			SIZE OF MATERIAL			
FORGED: HAND / DIE		ROLLED:		EXTRUDED:		CAST:		
MANUFACTURER:								
RESEARCH ANALYST:								
TYPE OF EQUIPMENT USED:								
FREQUENCY	1/2	1	2 1/4	5	10	15	20	25
CRYSTAL SIZE AND SHAPE		TEST BLOCK HOLE FACE TO TEST BLOCK FACE DISTANCE				HOLE DIAMETER		
IMMERSED				CONTACT				
MACHINE SETTING FULL AMPLITUDE HEIGHT:					LOSS OF BACK REFLECTIONS			
PHOTOGRAPHS	PARTS	SECTIONED DEFECTS		OSCILLOGRAMS	GOOD AREA	BAD AREA	TEST BLOCK	
TEST REPORT NO.				REJECTION TAG NO.				
SUMMARY OF TEST RESULTS:								
COMMENTS:								
COPIES:				SIGNED:				
				APPROVED:				

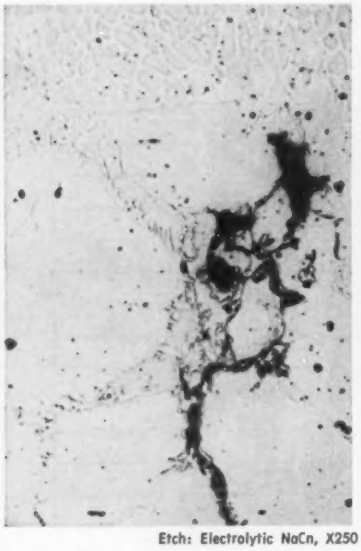
DOUGLAS AIRCRAFT CO., INC.
EL SEGUNDO DIVISION

Here is the report form Douglas inspectors use to record ultrasonic test data



Steel hand forging (left) which will be machined into main structural support member. Above is a section cut out of the center of the forging that shows a burst 12 in. long

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Etch: Electrolytic NaCn, X250

Fig. 1—Zinc contaminates stainless. The heat of welding will diffuse the it, causing cracks like this. Zinc penetrates wherever welding heat crosses contaminated area

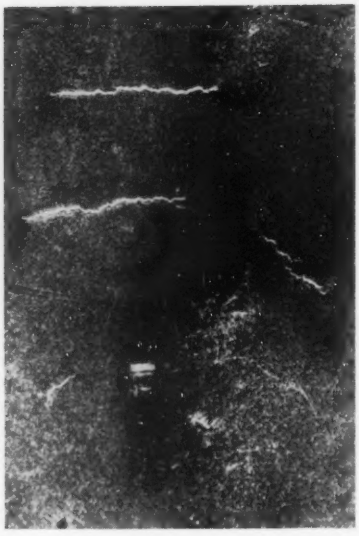


Fig. 2—Source of cracks can be subtle. These were caused by zinc in paint pigment. Paint was used on opposite side to mark welding location for a T joint

Fig. 3—At high temperatures, the damage caused by a contaminant like sulphur can be severe. A sulphonated soap was used to test weld. Rinsing would have prevented this

How To Avoid Trouble with Stainless Welds

Surface contaminants penetrate along grain boundaries when the base metal is heated by welding. The author describes two little noticed sources of contamination: Zinc and sulphur

By GEORGE E. LINNERT
Research Welding Metallurgist
Armco Steel Corp.
Middletown, O.

PART TWO

HANDBOOKS and other literature on the fabrication and installation of stainless steel equipment are quite emphatic about the damaging effects of contamination.

The material resists corrosion better when its surface is clean and smooth. Scale or oxide is a simple form of contamination. A more elusive type is carbon, which can carburize the surface and affect corrosion resistance.

Precautions against oxide scale or carbonaceous contaminants are widely known. Two other types—zinc and sulphur—don't receive adequate attention.

Effects—When present on stainless steel surfaces, zinc and many of its compounds produce intergranular penetration whenever the surface is heated to 1000°F or more. If the steel section is under tension, the rate of intergranular penetration is greatly increased. During welding, ⅛-in. sheets can be completely penetrated in a few seconds.

The metallographic appearance of such penetration in a welded section of Type 304 stainless is shown in Fig. 1. Zinc has penetrated the grain boundaries and diffused from the boundaries outward into the grains. Severe embrittlement produced results in the cracking along the penetrated boundaries.

Preventing zinc contamination requires vigilance. Shears and form-

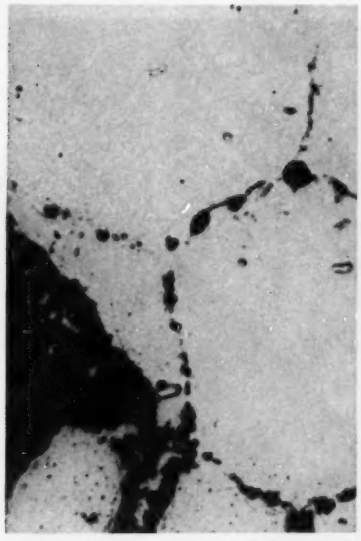


Fig. 4—This is sulphur penetration in Type 347 stainless at 1400°F. You can see the sulphides in the grain boundaries along the lower part of the illustration

Guide for Avoiding Welding Troubles

1. Watch for Notch Effects
   Here are some causes: Unfused notches, undercutting along the edge of weld beads, flat and convex fillet beads, excessive weld bead reinforcement, bad design. If you can't get the right contour in the weld bead, specify grinding or machining.
2. Guard Against Stress Corrosion
   Determine whether your product will be exposed to corrosives, especially those which contain chlorides. You can avoid some trouble by annealing or stress relieving. Consider using austenitic stainless grades which contain molybdenum. Ferritic types are also a good choice.
3. Eliminate Surface Contaminants
   Educate shop personnel. Show them the effects of carbon, zinc and sulphur. Have them remove soaps, paint, marking pencils, soldering fluxes and cleaners which contain contaminants.

ing equipment can be sources of contamination in shops which use heavily galvanized materials.

Such contamination is difficult to detect by eye. In one case, the edges of a number of Type 304 stainless sheets were contaminated with zinc. When they were welded, many small cracks formed in the base metal adjacent to the weld. They weren't detected until the unit was placed in service and it leaked—through the cracks. Welding repair was no solution because zinc particles still present caused further cracking. When the weldment surface was cleaned, the repair was easy.

Pigment—Another incident was more expensive. A large trailer truck tank was fabricated from Type 304 stainless sheet. It had several bulkheads which were welded to the inside of the shell with a T joint. A workman used some white marking paint to indicate the position of the bulkheads, and the operator frequently welded over the paint marks in making the joint.

After the tank was completed and pressure tested, many fine cracks (like those shown in Fig. 2) were found on the outside surface. The marking paint contained zinc oxide. Cracks were so numerous that repair was impracticable.

Other sources of zinc are forming dies, galvanized tie wire and identification tags. Any pickup of brass from guides, rollers and tools will also bring embrittlement

Meet the Author

George E. Linnert started his career as a metallurgist in 1935. He's been with Armco Steel Corp. more than 15 years.

During World War II, he worked with the National Defense Research Council and the Office of Naval Research to develop improved electrodes for the welding of armor plate and to improve the weldability of alloys used at high temperatures.

The inventor of a flux-injection process for torch cutting stainless steels, he holds eight patents on welding and cutting stainless.

Mr. Linnert is an active technical writer. He has had many papers on welding published, and he wrote the second edition of *Welding Metallurgy*, published in 1949 by the American Welding Society. He is a member of the board of directors of the American Welding Society, past chairman of the Maryland section, was the society's fourteenth Adams Lecturer and is a member of the American Society for Metals.

headaches — brass contains zinc.

Sulphur — Closer attention should be paid to sulphur-containing contaminants. Sulphur can penetrate the austenitic stainless intergranularly when the steel is heated to a high temperature.

The contaminant must be protected by a nonoxidizing atmosphere before it can get into the steel. An oxidizing atmosphere burns the sulphur before it can penetrate and cause damage.

The usual pattern of surface damage is illustrated in Fig. 3. Sulphides of an undetermined composition can be seen in the grain boundaries at a depth of two or three grains. As the sulphides penetrate, deterioration of the grain boundaries and the grains occurs closer to the surface.

This mechanism probably involves the formation of a low-melting nickel sulphide in the grain boundary, resulting in a complex form of deterioration. The straight-chromium grades of stainless aren't quite so susceptible.

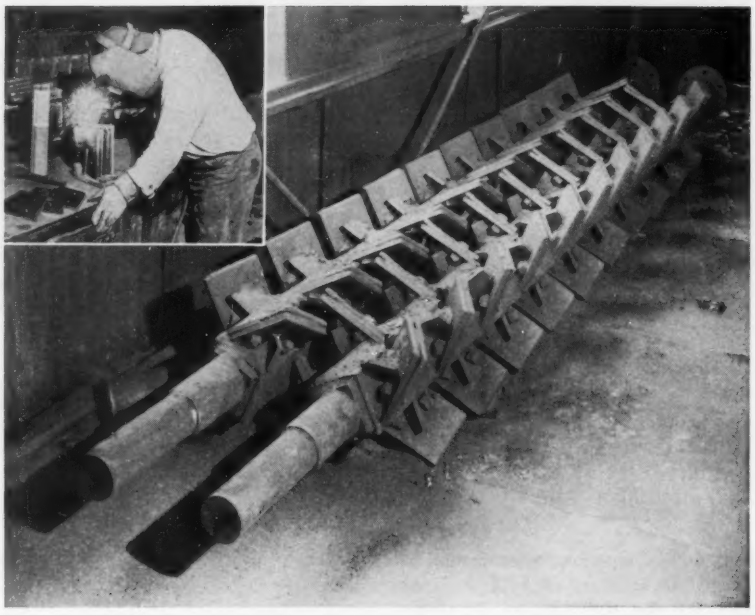
Uninvited Guest—The origin of sulphur in some weldment failures is surprising. A vessel made of Type 309 operated at about 1700°F in a closed electrical furnace. Bad scaling along the weld was at first attributed to faulty welding, corrosive flux or slag.

Investigators found that the weld joint had been leak tested with a sulphonated soap solution which was left on the vessel. There was enough sulphur in the compound to cause the damage shown in Fig. 4.

A container made of Types 309 and 347 was used to handle molten lead. Powdered coal was sprinkled on the surface of the molten lead to minimize dross formation. The coal contained sulphur which entered the lead, then diffused into the inside surface of the stainless container. The damage was like that shown in Fig. 4.

Charcoal or some similar sulphur-free material would avoid this problem.

• *An extra copy of this article and Part I which appeared last week are available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Welder is applying hard surfacing material to a rotor blade. Buffalo Sintering Corp. says it can also rebuild blades the same way

These Pug Rotors Last Longer

Hard facing extends the life of parts in contact with rough, abrasive materials. This sintering firm gets more mileage by applying supertough metal with an arc electrode

YOU can minimize blade wear in a pug mill with a hard-facing alloy containing chrome borides.

Process—The pug mills used by the Buffalo Sintering Corp., Chicago, convey a highly abrasive mixture of coke and iron ore dust.

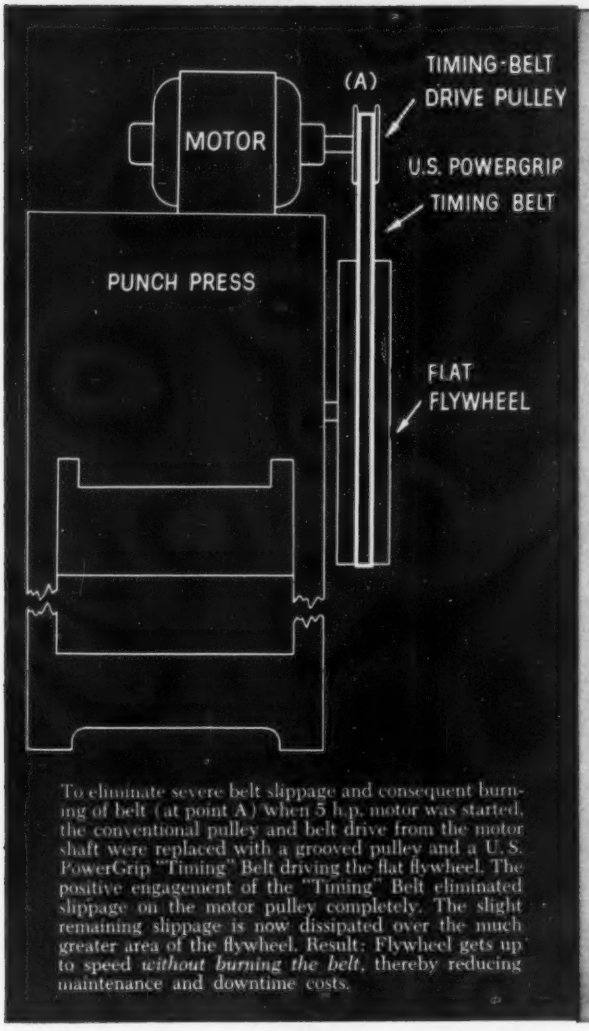
The sintering process reclaims ore dust expelled by blast furnaces. The abrasive nature of the dust makes rotor blade maintenance a serious problem. Hard facing is the most practical method of reducing blade wear and down time.

Choice—Which hard-facing alloy to use was a problem for engineers at Buffalo Sintering. A test program showed that good results are obtained with either of two materials: Tungsten carbide or Colmonoy No. 1, an iron-base alloy containing chrome borides. Buffalo Sintering chose Colmonoy in preference to the other two.

Procedure — Rotor blades are fabricated from boiler plates. The hard-facing alloy is applied by electric arc welding. Three uniform beads approximately ¼-in. thick are applied to the working face of the blade, blade ends and edges. This is done in a single pass using a ¼-in. electrode. Blades are then ready for installation in the pug mill rotor.

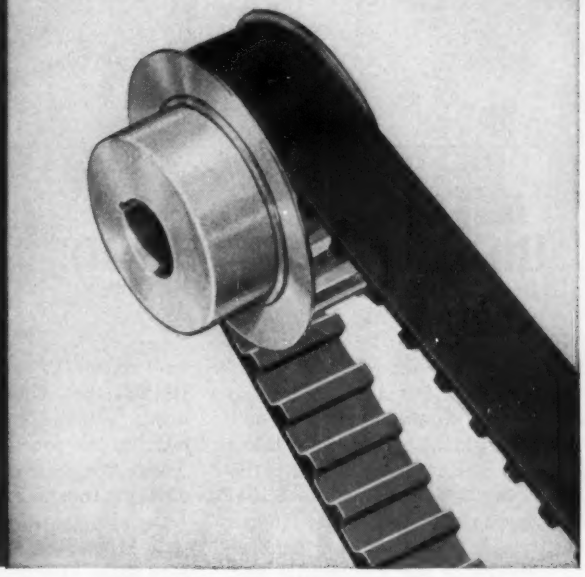
Hard facing is also used by Buffalo Sintering to protect wearing surfaces of swing spouts and skid rails.

US RUBBER *PowerGrip "Timing" Belts*



To eliminate severe belt slippage and consequent burning of belt (at point A) when 5 h.p. motor was started, the conventional pulley and belt drive from the motor shaft were replaced with a grooved pulley and a U.S. PowerGrip "Timing" Belt driving the flat flywheel. The positive engagement of the "Timing" Belt eliminated slippage on the motor pulley completely. The slight remaining slippage is now dissipated over the much greater area of the flywheel. Result: Flywheel gets up to speed *without burning the belt*, thereby reducing maintenance and downtime costs.

How a plant engineer made this press deliver a better punch



This is one more example of the U.S. PowerGrip "Timing"® Belt's ability to simplify and improve a power transmission unit . . . one of the reasons why the invention of this belt was recently awarded the Franklin Institute's Edward Longstreth Medal for "Invention of High Order."

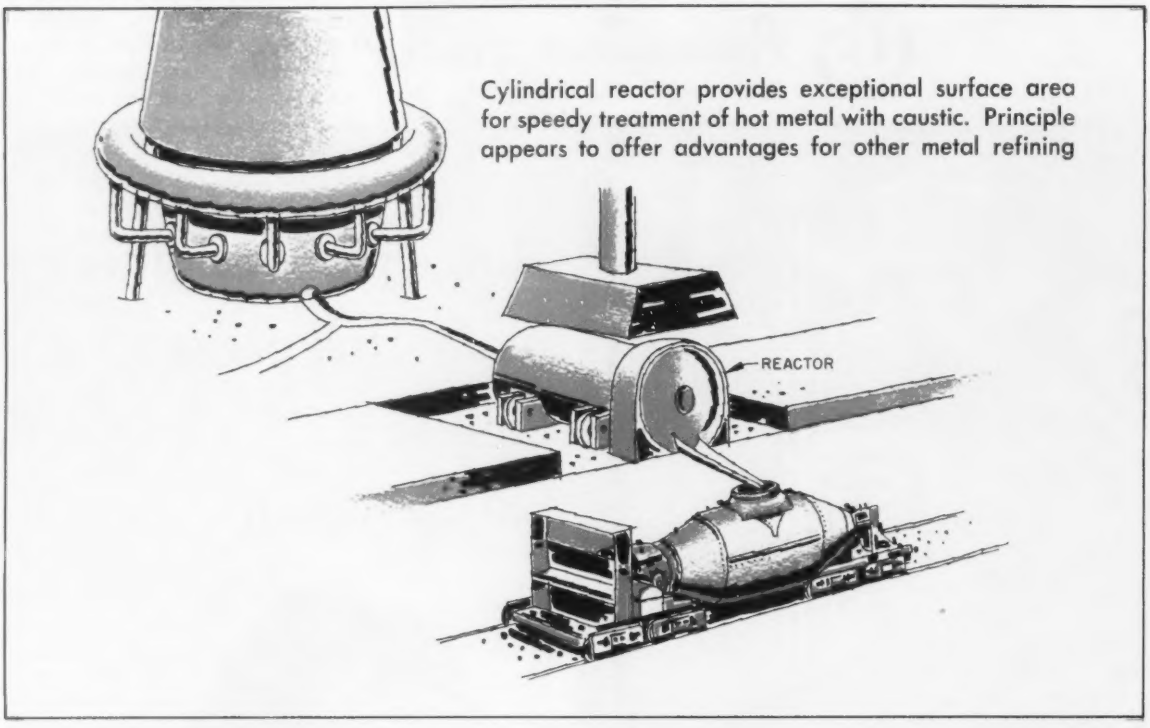
Whether it's a plant conversion or original equipment design problem, U.S. PowerGrip "Timing" Belts offer the plant and design engineer all these advantages:

- *no slippage, no take-up—allows short centers, high ratios.*
- *absence of metal-to-metal contact—eliminates need for lubrication and housing devices.*
- *handles speeds up to 16,000 F.P.M. or so slow as to be imperceptible to the eye.*
- *close to 100% efficiency.*
- *imbedded with steel cables for high tensile strength.*
- *constant angular velocity.*

These belts—plus expert engineering service—are obtainable at "U.S." power transmission distributors, at any of the 28 "U.S." District Offices, or by writing us at Rockefeller Center, New York 20, N. Y.

US RUBBER **Mechanical Goods Division**

United States Rubber



Cylindrical reactor provides exceptional surface area for speedy treatment of hot metal with caustic. Principle appears to offer advantages for other metal refining

Sulphur and Silicon Lowered Fast

THE WRAPS are off the Diamond Alkali desulphurizing process. It uses a cylindrical reactor (so simple you wonder why it hasn't been thought of before) that takes in hot metal at one end and turns it out desulphurized at the other.

Its uses don't stop there. It can desiliconize iron. It can dephosphorize it. It can recarburize and decarburize. It could become a contender in direct reduction.

The blast furnace can be operated on low slag volume so that the coke rate goes down and sulphur and silicon in the iron shoot up. It will be more economical to bring sulphur and silicon down later in the reactor, says Diamond Alkali Co., Painesville, O., sponsor of the process.

Development—Originator of the idea is Cleveland consultant Norman Goss. He holds basic patents. Battelle Memorial Institute developed and tested the reactor. Consultant Harry McQuaid has worked on its economics and has charted its possible applications.

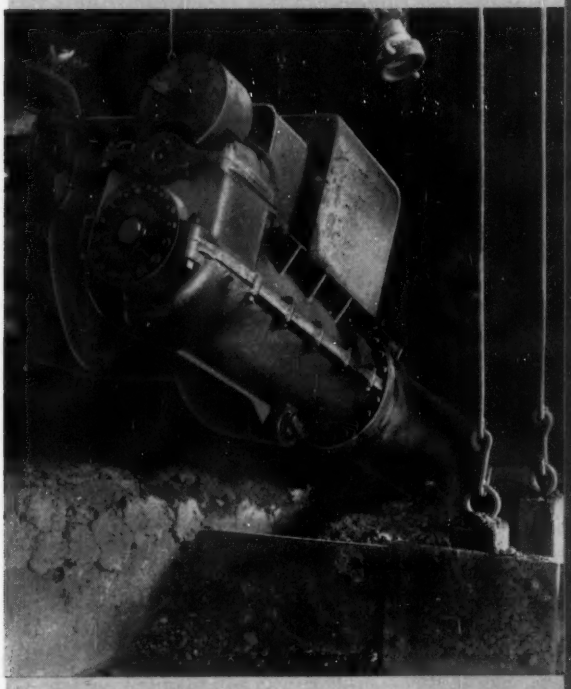
The process is efficient because it brings hot metal and desulphurizing chemicals into contact over a large agitated surface. The reaction is fast, continuous and controllable. An experimental unit, operating at Battelle since 1955, has consistently produced a 90 per cent reduction in sulphur (to as low as 0.002 per cent).

Results—Sulphur reduction from 0.03 to 0.003 per cent is typical. In some experimental heats, the

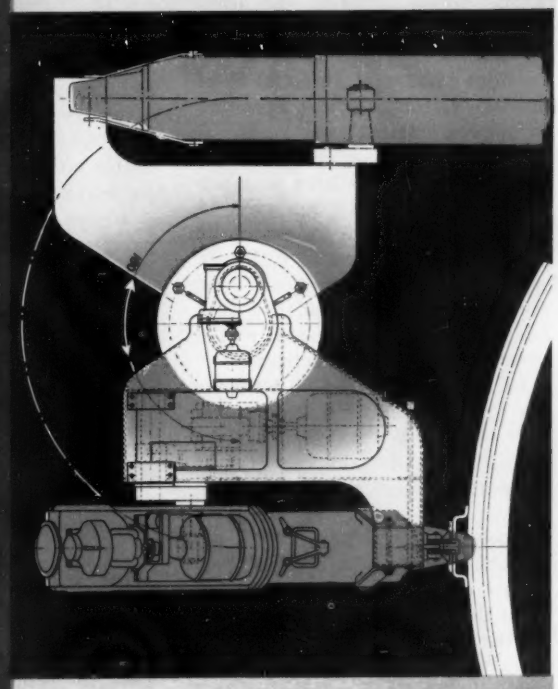
Typical Results—Diamond Alkali Reactor

Heat	Reagent	Per Cent Sulphur In	Per Cent Sulphur Out	Per Cent Reduction	Per Cent Silicon In	Per Cent Silicon Out	Per Cent Carbon In	Per Cent Carbon Out	Per Cent Manganese In	Per Cent Manganese Out	Per Cent Phosphorus In	Per Cent Phosphorus Out
A	Caustic Soda	0.110	0.008	93	2.24	1.74	3.50	3.33	...	...		
B	Caustic Soda	0.041	0.004	91	1.49	0.91	3.98	3.94	0.37	0.36	0.097	0.084
C	Caustic Soda	0.027	0.002	93	0.61	0.21	4.31	3.95	0.19	0.16	0.033	0.014
D	Soda Ash	0.110	0.020	82	1.99	1.45	3.43	3.37	...	...	...	...
E	Soda Ash	0.041	0.015	64	0.62	0.36	4.12	4.03	0.40	0.31	0.045	0.045

POWER FOR MAINTAINING LONG TAPPING HOLES



FAST POSITIONING WITH ACCURATE CONTROL



YOU ARE SURE OF BOTH WITH Bailey CLAY GUNS

With clay pressures of 600 psi, Bailey Clay Guns have the power you need for plugging and maintaining long tapping holes. Fast, accurate positioning is assured by a unique mounting and operating system powered by three separate electric motors. Bailey Clay Guns have been proven safe and dependable for both blast furnaces and electric furnaces.

CAPACITIES

Bailey Clay Guns are built in four sizes with clay capacities, as follows:

- 3 cubic foot
- 6.5 cubic foot
- 9.6 cubic foot
- 13 cubic foot

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA

element was brought below the level of analysis.

The reactor is designed to use either molten sodium hydroxide or soda ash as the desulphurizing agent, but other chemicals could be used. Caustic soda and soda ash are overabundant by-products of Diamond Alkali's chlorine plants, which explains the company's interest. If the reactor catches on, it could mean a tremendous market at 10 to 40 lb of caustic per ton of iron (depending on sulphur content).

Silicon—Using only caustic, the process can lower silicon as much as 50 per cent in 1 minute (1.5 down to 0.8 per cent, for example). Bringing silicon down to 0.25 with caustic is perfectly practical in the reactor at a cost of less than $2 a ton. This brings hot metal within practical limits for electrics.

Oxygen could be added by lance for further refining and temperature control. Without oxygen, the temperature drop in the reactor is less than 100°F; with oxygen injected, it could be held constant or increased.

Refractories — Steel plant personnel who have seen the process raise the question: What happens to the refractories? (Shortened refractory life is the usual consequence of ladle desulphurization.) It comes as a surprise to see the lining in the experimental reactor unaffected by the caustic.

The answer lies in letting the metal enter the reactor just before the caustic. Being heavier, it maintains a protective layer next to the spinning refractory. The reaction takes place so quickly that no unreacted caustic penetrates to the refractories. Another effect of the fast reaction is to reduce fumes. Hooding of the reactor completely controls them.

Future—In a steel plant, the reactor could discharge directly into a bottle car or mixer. Production units would be small enough to be located directly at the blast furnace, at the mixer, or at some intermediate location. A 1½-ton per minute pilot reactor is being built for a large midwestern steel plant. A full scale unit could probably be built for less than $100,000 and would occupy no more than 150 sq ft.

Tapes Continue To Gain Ground

Another tape guided jig borer joins the ranks of numerically controlled machines in production . . . machine tool sales still sliding . . . Washington may sell its tools

TAPE CONTROLS for small and medium production runs took another step forward when Fosdick Machine Tool Co., Cincinnati, recently introduced a tape controlled jig borer.

To run it, the operator loads the part on the machine table, presses a button that positions the table (within ±0.0001), then sets the spindle speed and the feed according to values punched on the tape.

Tape Prep—Dimensions from part prints are punched directly into the tape without coding since a decimal punch is used. The tape then goes in a reader at the machine. The reader feeds information to a memory unit.

As the operator pushes the machine cycle button, information from the memory is passed on to the machine measuring system. For table measurements along the two co-ordinates, two series of class A measuring gages are lined up. The tape tells the machine which combination of these end-measuring gages to select for a given table setting.

Cost — Fosdick executives say they will add table and saddle positioning to their Fosmatic jig borer for about $10,000 over the base price of the machine. For another $2500, they will add tape control of speeds and feeds.

Orders Slide

Machine tool builders still are convinced that the long term outlook for sales is good.

The short term picture is not so rosy. In May, new orders dipped to $41.5 million, the lowest mark since November, 1954. The decline has been working steadily since the beginning of the year. The figure for April was $51.3 million.

Backlogs also fell. They now stand at an average of about 4.6 months.

Only a continuing high level of inquiries brightens the immediate picture—that and the hope that several big tooling programs will break soon.

Shipments (the payoff column) continue at a high rate. The industry turned out $78.7 million worth in May. Going at that rate through December, it will rack up a $971 million year, which is terrific for peacetime. With order backlogs now down to a point that builders like, shipments may be shaved, but even with a lower shipment rate, the year is bound to be prosperous.

Government Sale

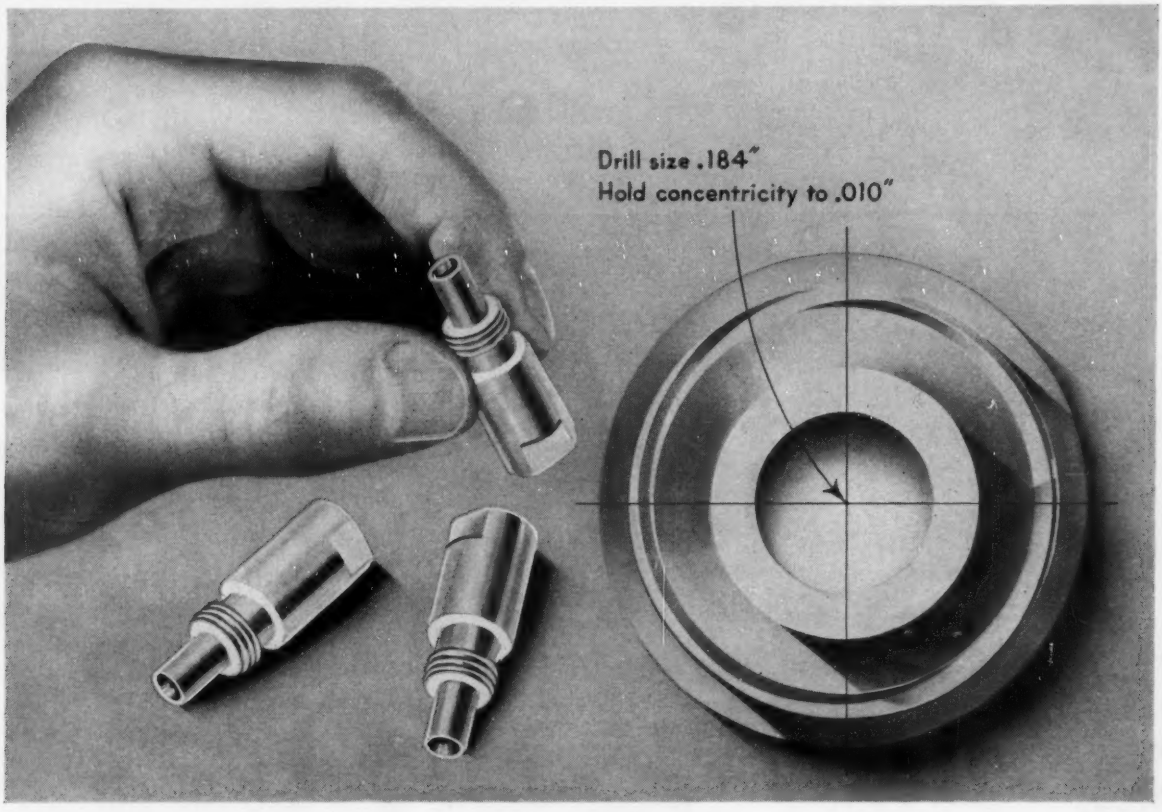
The Air Force concept of the short war will take the government out of the machine tool business. The Defense department already has requested authority to sell its industrial facilities, including related machine tools, without resorting to advertised bids. (STEEL, June 17, p. 60)

The decision to sell shows that top administrators feel there is no longer a need for a mobilization base. The next war, they reason, will be so short it will be won or lost on the basis of weapons ready to go when (and if) the shooting starts.

Machine tool builders are confident that the dumping of government tools will not lead to another postwar fiasco. After World War II, Washington flooded an already tottering machine tool market, sending builders into a private slump.

One industry spokesman who admitted that it didn't make sense for the government to own $3 billion worth of machine tools expressed no concern about the forthcoming sale.

How Anaconda can help you get the exact Rod to fit the job



THE broad line of Anaconda free-cutting copper and copper-alloy rods gives you widest latitude in selecting from warehouse stock the precise rod for most screw machine jobs. But every once in a while there are special requirements.

One company's problem: The M. J. Grass Screw Machine Products Co., Buffalo, N. Y., machines a part for a gas-burner base from ½" round free-cutting brass rod. Specifications call for a hole $1\frac{1}{16}$" deep by .184" in diameter—with concentricity held to .010".

With standard free-cutting brass rod the drill had a tendency to wander, running the concentricity off as much as .024". To correct this, The American Brass Company provided rod stock with a minor variation in fabrication for deep drilling. This free-cutting brass rod has a slightly harder core, which minimizes the tendency of the drill to run off center at the high drilling speeds used. Now M. J. Grass holds the concentricity to .008" or under. With regular free-cutting brass, rejects ran as high as 15%. With the deep-drilling rod, there are no rejects.

Your requirements: Anaconda Rods are consistently uniform in composition, temper, and free-cutting characteristics. Consequently, they make possible easy duplication of cutting speeds and feeds known to be satisfactory from previous job records.

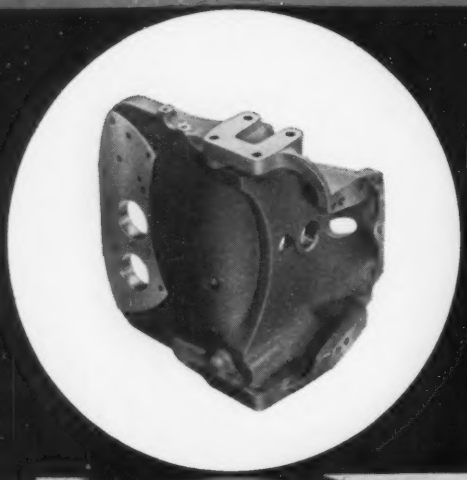
When you need special physical characteristics, such as a harder core for deep drilling or additional ductility to permit spinning or cold forming after machining, either the temper, the alloy, or both can be adjusted to meet your requirements.

Free technical service: It is the function of the Technical Department of The American Brass Company to assist metal users in the solution of special problems. This service is at your disposal without charge.

Comprehensive data on composition and machinability of standard Anaconda Alloys, standard specifications, weights, and dimensions of standard rods is available in Publication B-3. For this booklet – for special technical assistance – write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5770

ANACONDA® RODS FOR SCREW MACHINE PRODUCTS

MADE BY THE AMERICAN BRASS COMPANY



At Massey-Harris-Ferguson

Natcos Save 100 Parts...

Three multiple-spindle Natcos bore, drill, spotface and tap the front end support for a Massey-Harris-Ferguson tractor

NATCO

60 Man Hours Every

on Rugged Axle Support Castings

Massey-Harris-Ferguson checked it two ways. Nine general-purpose machines would do the job—or 3 Natcos. They chose the Natcos for these reasons:

- *Saving of $30,000 in machine cost*
- *Saving of 60 man hours every 100 parts*
- *Saving of 65% in floor space*

The Natcos handle all drilling, boring, spotfacing and tapping—a total of 67 operations on the 182-pound front axle casting. The casting is heavy, irregular—tough to fixture and clamp. The Natcos meet production requirement of 11 parts per hour.

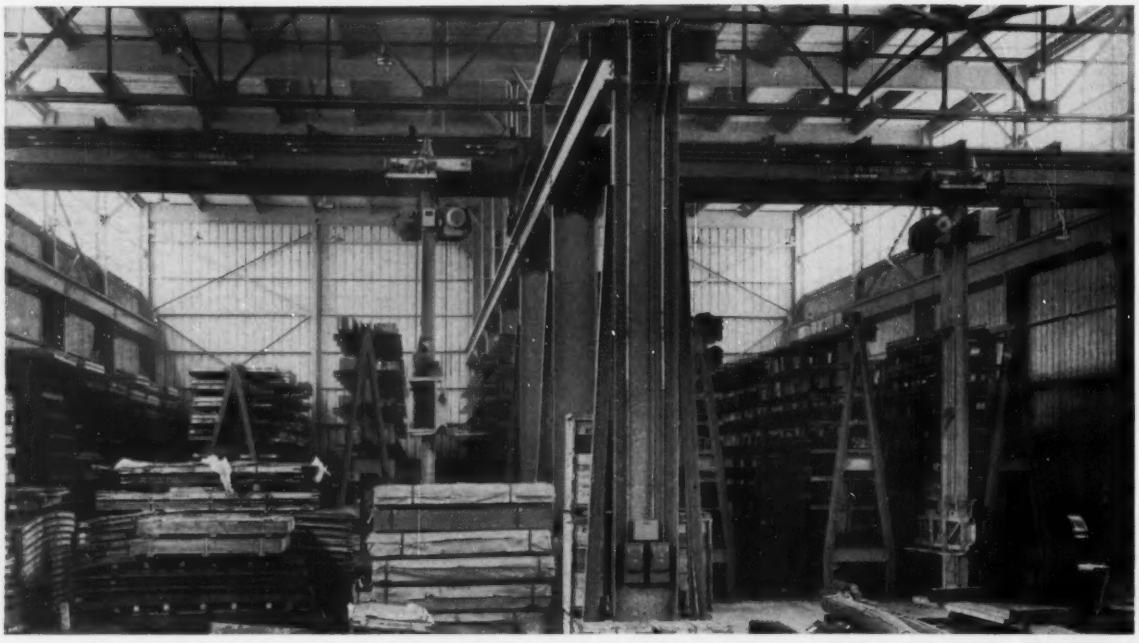
Natco provided complete tooling which features automatic clamping, cycling and chip blow-out. All three machines are of unitized construction, giving Massey-Harris-Ferguson the flexibility to run different parts of redesigns of the same part.

Let Natco Field Engineers point out cost-saving and time-saving methods on your next drilling, boring, facing or tapping job. Natco offices are located in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

National Automatic Tool Company, Inc.

Richmond, Indiana

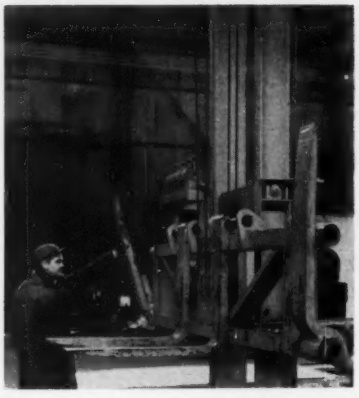
Multiple-spindle drilling, boring, facing and tapping machines. Special way-type, index and transfer machines.



A 5-ton stacking crane in each bay of the Toronto warehouse addition permits maximum use of space

Cranes Stretch Warehouse Space

New storage racks and stacking cranes help Canadian firm get maximum use of storage space at minimum handling costs in its new warehouse addition



Each column has four forks to handle long shapes. Outside forks are flopped back to handle palletized or crated material

OFFICIALS at A. C. Leslie & Co. Ltd., Toronto, Ont., estimate they saved 22 per cent in building costs when they put up their new warehouse addition.

A larger addition would have been necessary to get the same storage capacity if they had continued their former storage and handling methods.

Savings at a similar, but larger, addition to their Montreal, Que., warehouse totaled 37 per cent.

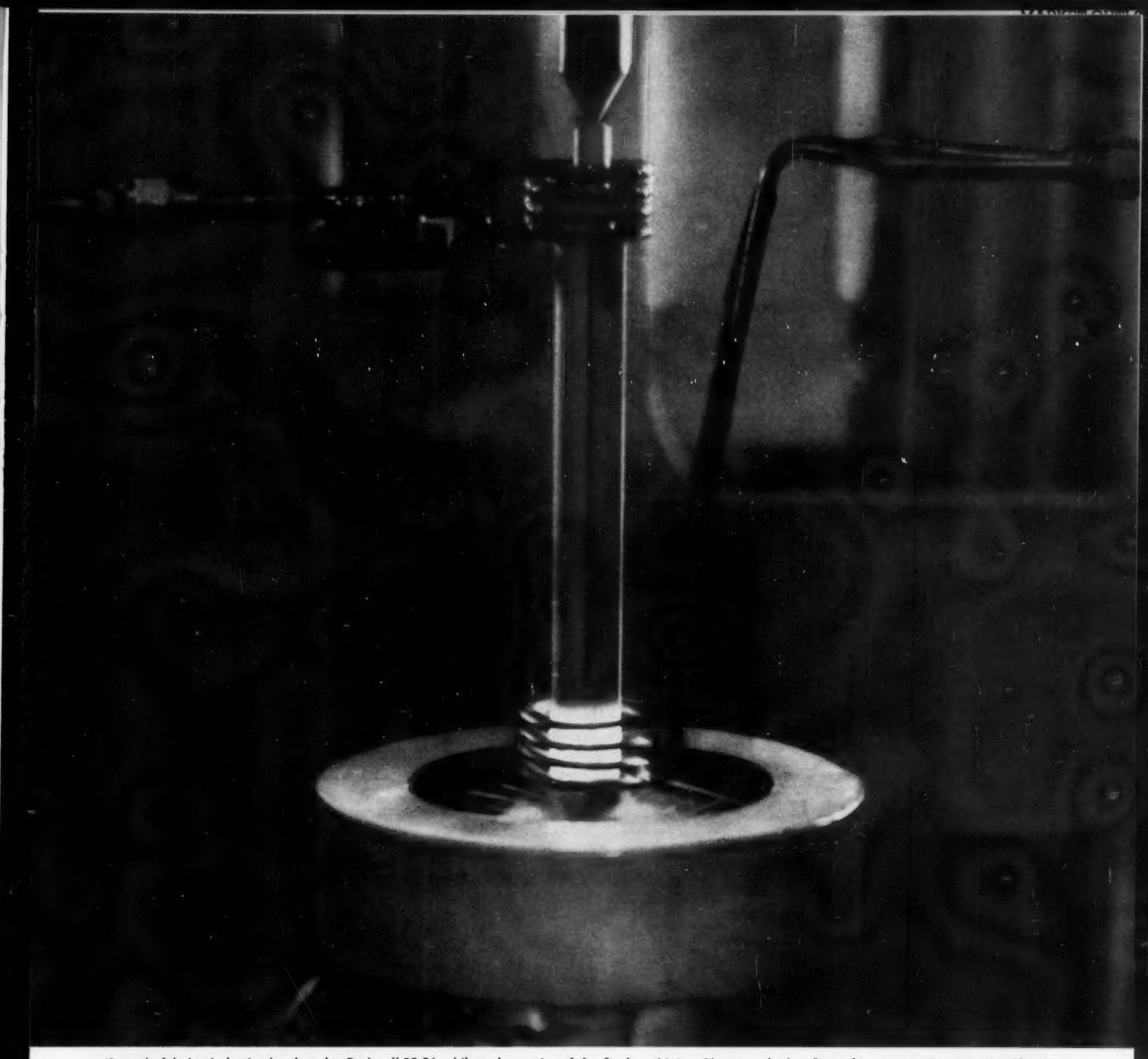
Cranes—The photo above was taken in Toronto. The 5-ton cranes are Chicago Tramrail Corp.'s top-running Trak-Raks. The storage racks are about 18 ft high and aisles are considerably narrower than those which conventional cranes would require.

Each crane operates in a 40-ft bay. The operator rides with the fork lift, which allows him maximum visibility in handling.

Crane motions: Hoist—up and down; bridge—forward and backward; trolley—in and out; column rotation—clockwise and counterclockwise. To speed operation and provide maximum safety, limit switches prevent the crane column from running into a rack in any direction of travel. Continuous rotation is possible only when the unit is beyond the end of the racks; this prevents inadvertent swinging of a load while between racks.

Storage Cupboard — The Montreal warehouse has three bays, each equipped with top-running cranes adapted for crossovers. The two outside bays have Trak-Rak columns and the center bay a deck-hoist crane. Another feature is that each Trak-Rak has a "storage cupboard."

With this combination, either column crane can be taken into the center bay and the deck-hoist into either outside bay. With the columns in their "cupboards," the deck-hoist can operate the full width of the bridge.



Ketos shaft being induction hardened to Rockwell 55-56, while ends remain soft for final machining. Photographed at Control Instrument Co., Inc., Brooklyn, N. Y.

KETOS has wide hardening range with minimum volume change...

Ketos is a low priced alloy tool steel that can be hardened from low temperatures with practically no volume change. It has deep hardening qualities, and a fine grained structure, that make it desirable for many production parts.

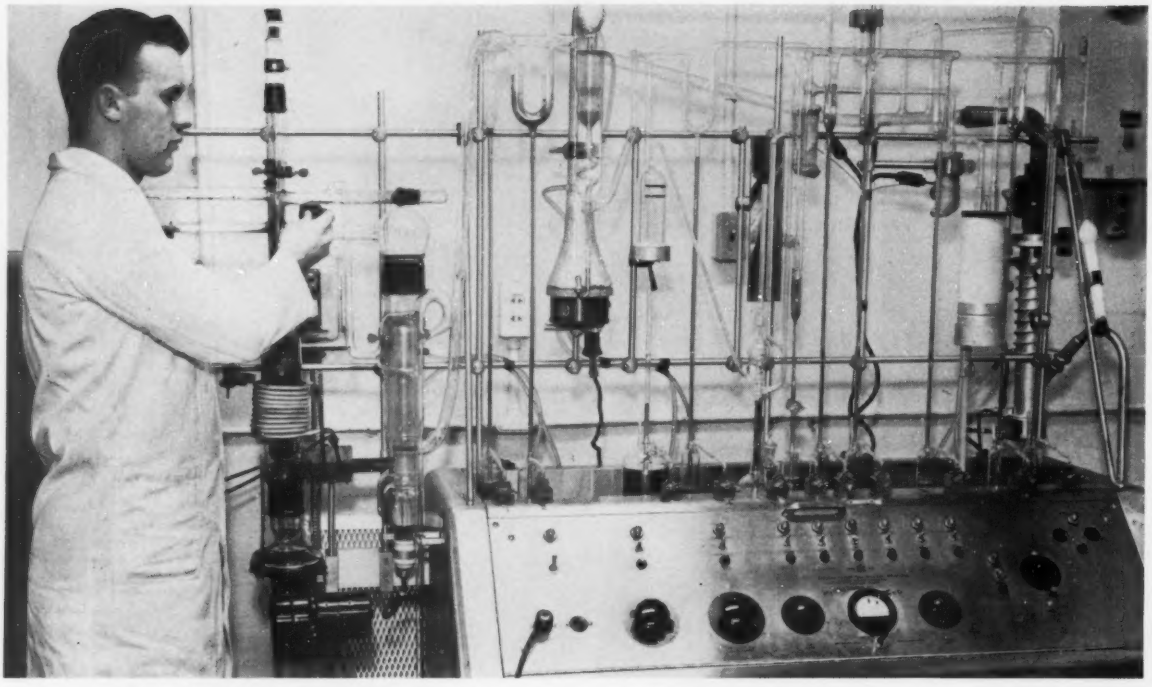
That's why nondeforming Ketos is well suited not only for most tool steel applications such as gauges, dies, and taps but also for close-tolerance, wear-resistant parts like the actuator bar shown in the induction heating unit above. The thin contact edges of this particular part withstood a "life test" of over 4-million high speed blows. No other steel tested lasted more than 1-million cycles before it chipped and failed.

If Ketos sounds like the steel you should be using, call your nearby Crucible warehouse. Stocks of Ketos and dozens of other special tool steels are large, delivery fast. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor—Railway & Power Engineering Corp., Ltd.



A Martin technician is using a magnet to move a sample of titanium alloy to the end of the glass tubing where it will drop into the furnace prior to analysis. This method is called vacuum fusion gas analysis

Hydrogen Control in Titanium

Forming problems are being eliminated by checking the metal for hydrogen embrittlement before starting production. Part failures unaccounted for previously are traced to hydrogen

TITANIUM readily absorbs gases and becomes embrittled. The problem is significant in alloys containing 0.0125 per cent hydrogen.

Alpha alloys have a type of embrittlement which is pronounced at high testing speeds, alpha-beta alloys have embrittlement which becomes severe at slow testing speeds.

Testing—Martin Co., Baltimore, has found that man-hours and money can be saved by testing the metal before it is considered for production.

The company uses a vacuum fusion gas analysis apparatus developed by the National Research Corp. The titanium it uses must meet government specifications—less than 125 parts of hydrogen per million.

Procedure—A sample is weighed to 0.0001 gram accuracy and placed in an induction heating furnace.

When the metal reaches 2550°F, the hydrogen is driven off and collected. By measuring the vapor pressure of this gas, you can compute the percentage of hydrogen since the weight of the sample is known.

Removal—Because solubility is dependent upon pressure, hydrogen can be removed by vacuum annealing. Disadvantages: The process is expensive, and present equipment restricts the size of parts than can be treated.

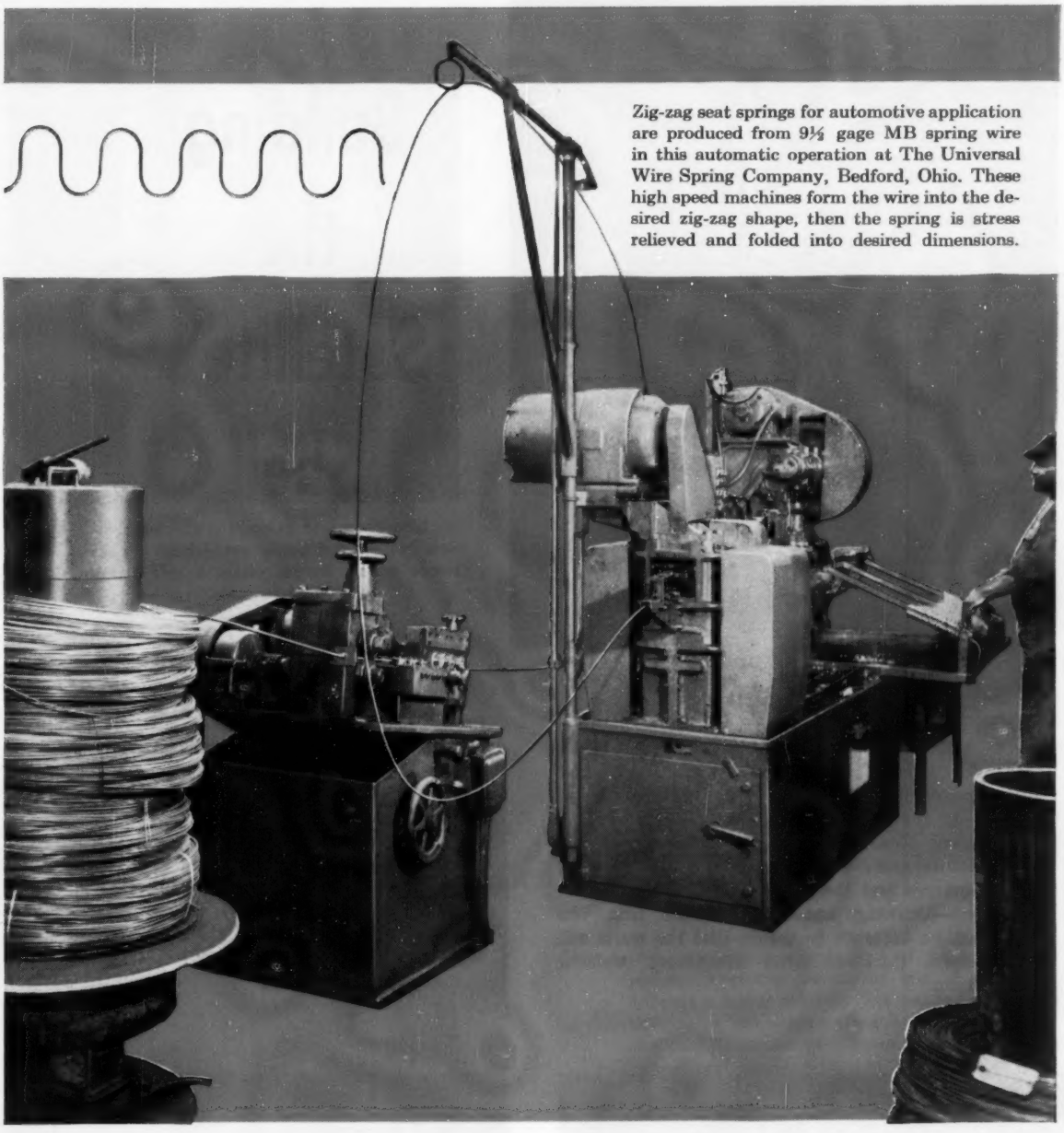
Control — Producers are now reducing the hydrogen content of their alloys. They outgas the sponge and use a double-melt technique in which one of the melts is made under vacuum.

Testing Widespread—Steel Improvement Forge Co., Cleveland, offers another example of close laboratory control. It uses the Bureau of Mines's Codell chemical analysis for the determination of hydrogen content.

Other methods used are the "tear test" for sheets and the "notch test" for bars.

Other Impurities—In addition to hydrogen (which may be absorbed at 300°F), oxygen, carbon and nitrogen are absorbed by titanium (above 1200°F). Limits set for these elements are oxygen, 0.20 per cent; carbon, 0.20 per cent; and nitrogen, 0.07 per cent.

All these impurities have effects on toughness, notch sensitivity, weld ductility, machinability and bend ductility.



Zig-zag seat springs for automotive application are produced from 9½ gage MB spring wire in this automatic operation at The Universal Wire Spring Company, Bedford, Ohio. These high speed machines form the wire into the desired zig-zag shape, then the spring is stress relieved and folded into desired dimensions.

AUTOMATIC production requires AUTOMATIC quality of

J&L SPRING WIRE

Every coil of J&L spring wire is thoroughly tested for uniformity of physical and dimensional properties. This uniformity of J&L's famous Mastercraft, hard-drawn MB or Electromatic oil-tempered MB spring wire speeds production, reduces rejects, in automatic operations.

J&L exercises rigid quality control in every phase of production from ore mine to finished product. J&L wire is tops in quality . . . competitive in price.

Call your J&L representative the next time you order spring wire. Or write direct to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin STEEL
. . . a great name in steel

Building the Satellite's Shell

FORMING a distortion-free sphere with a wall thickness of 0.028 in. was the chief problem faced by Brooks & Perkins, Detroit, in the construction of major components for the earth satellite. (They're displayed in the photo above by J. S. Kirkpatrick, vice president of research and development.)

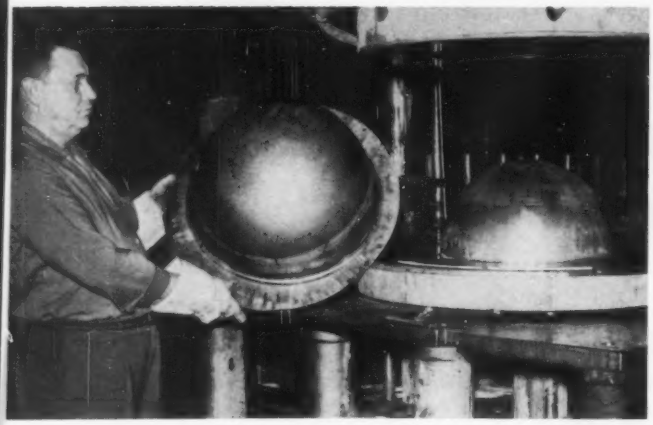
This picture story shows the steps in fabricating the hemispheres and the internal structure.

Precision—Drawing and spinning, the first two steps, must be accurate to assure that the walls will have uniform thickness after machining, welding and polishing.

Production—At least 12 of these spheres have been delivered to the Naval Research Laboratory where they are being tested with the three-stage rocket made by Martin Co., Baltimore. It will carry the ball into space.

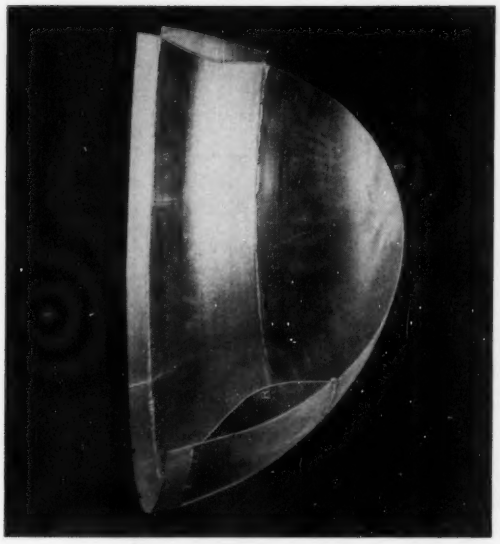
The 20 in. diameter sphere will circle the earth every 90 minutes with a payload of 17 lb of electrical equipment for scientific research in the outer atmosphere.

Delays—Slow construction of the 12 tracking stations has moved the launching date to 1958. It had been scheduled this year.

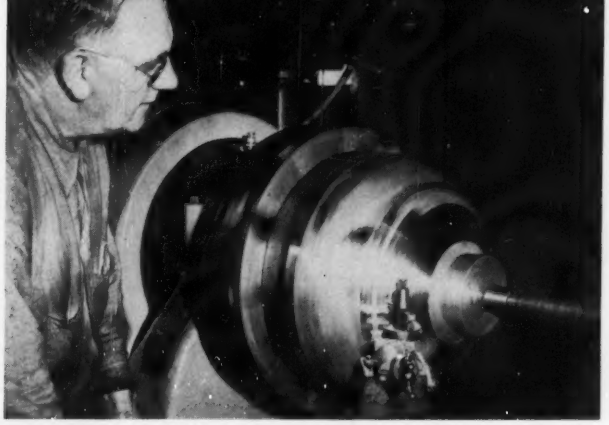


Step 1: A circular magnesium blank 0.091 in. thick is deep drawn. The metal is heated to 650°F and colloidal graphite, made by Acheson Colloids Co., Port Huron, Mich., is used as a parting agent

Step 2: The AZ31B alloy (96 per cent magnesium, 3 per cent aluminum, 1 per cent zinc) is spun (at 600°F) to exact dimensions. An inner ring is then spun from flat stock



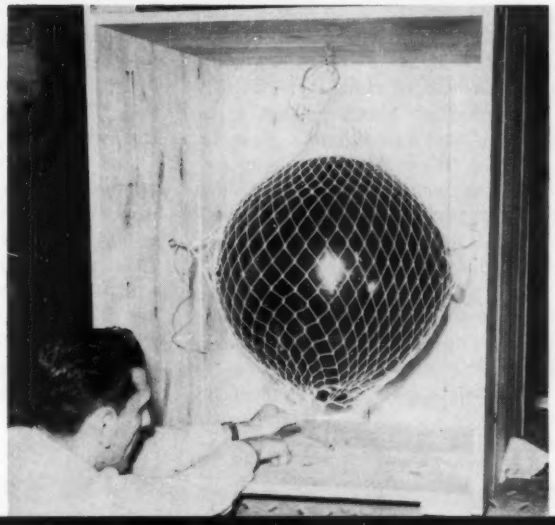
Step 3: The inner ring is trimmed and positioned inside the hemisphere where it is welded into place. The cutaway section above shows the resulting pressure chamber

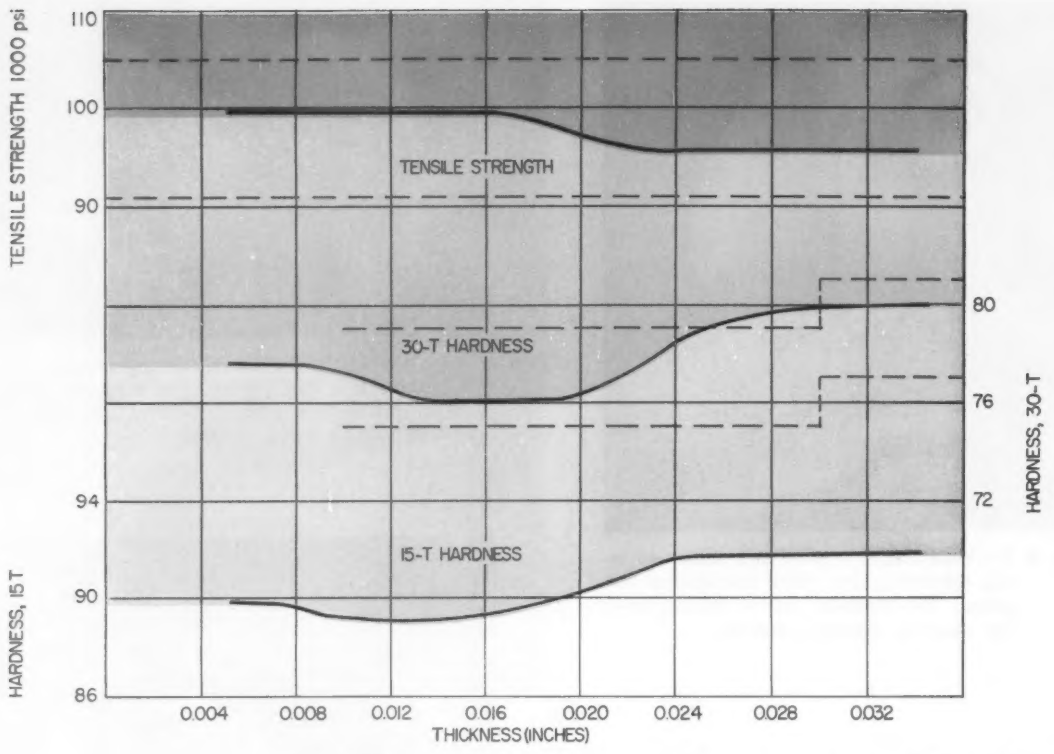


Step 4: After heating the shell to relieve any stresses, the weld is tested. It is then placed over a precise machining block and machined to finish thickness (most of the surface must be 0.028 in. thick)

Step 6: All components are buffed to high mirrorlike polish. Here the interior of one of the hemispheres is being polished. In succeeding plating operations, the inside surface is coated with gold; the outside surface gets layers of chromium, aluminum and silicon monoxide. Step 7: Shipping is made with net suspension shown below.

Step 5: A special jig is used in the assembly of the internal frame. The structure, which is made of magnesium tubing, is stress relieved and the outside surfaces are machined





These graphs compare the hardness and tensile strength of phosphor bronze strip (Grade A, 5 per cent Sn, spring temper). Dashes are specification limits

Thin Strip Hardness Can Be Misleading

You may have to rely on a tensile test if you want accuracy, says the author. These graphs show that hardness readings can vary without a corresponding change in strength

THE graph above illustrates how the superficial hardness of thin phosphor bronze strip doesn't always indicate tensile strength accurately. If such values are critical, it's best to run a tensile test.

Rapid—The hardness test is a popular inspection tool. Results are easy to obtain and reproduce. It's inexpensive, compared with other inspection techniques. Sometimes, it's the only practical test for odd sizes and shapes.

One limitation not fully recognized is thickness. It is advisable to use a superficial hardness tester for thin stock.

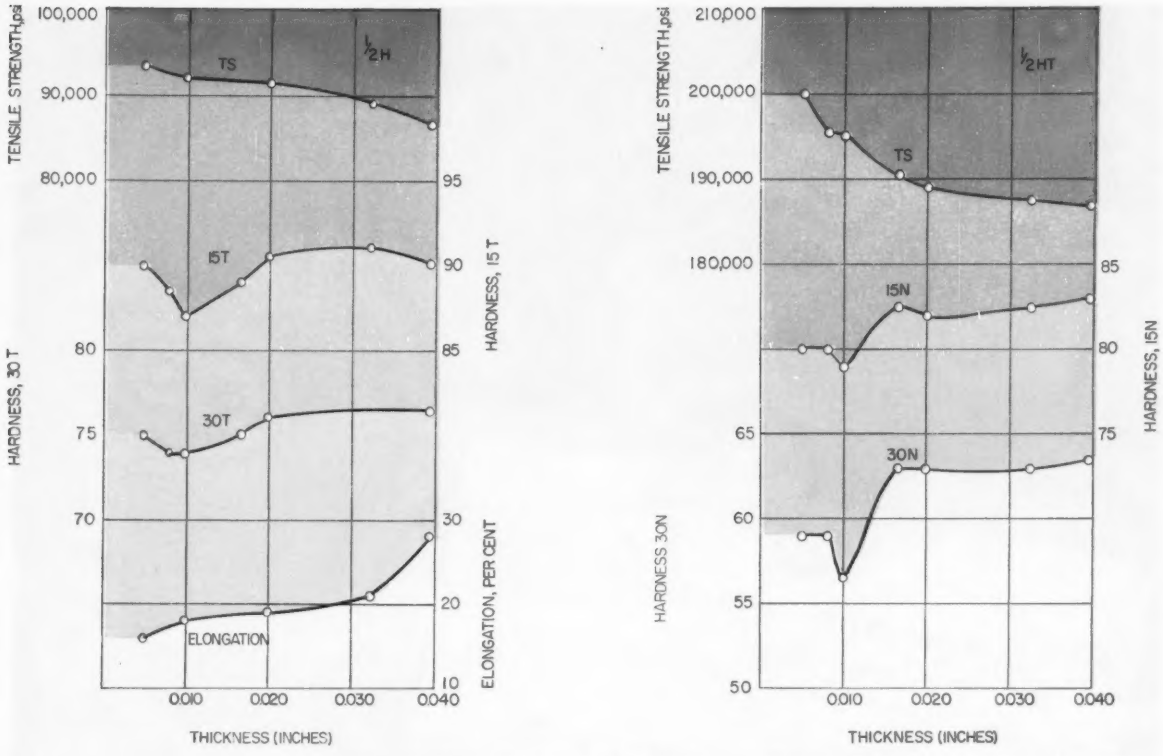
Inconsistent—For strip used in hardness testing, the minimum thickness specification for beryllium copper is different from that for phosphor bronze. Thicknesses for beryllium copper are limited to 0.010 in. for the superficial 30T and 30N tests, or 0.032 in. for Rockwell B and C scales.

For phosphor bronze, 0.010 in. applies to the superficial tests. Rockwell B readings may be taken on thickness as small as 0.020 in. This ignores the fact that, for equivalent tempers, beryllium copper is substantially harder than phosphor bronze.

Higher hardness ranges also apply to thick phosphor bronze strip. Higher minimum hardnesses are specified for thicknesses above 0.030 in. on the superficial 30T scale or 0.040 in. on the B scale. Superficial 15T and 15N tests are generally thought unreliable.

Samples—To determine the influence of strip thickness on hardness, a number of phosphor bronze strips, 0.005 to 0.034 in. thick, were taken from stock. All samples were grade A (5 per cent Sn) strip rolled to spring temper (8 numbers hard).

The strips were given tensile and superficial hardness tests. The results show that there is an increase in the hardness range at 0.030 in. The average tensile values for the strips vary plus or minus 2500 psi, while 30T hardness readings stay within the range of plus or minus 1 point. Despite an increase in tensile strength with decreasing thickness, there is a defi-



Here are the effects of stock thickness on the mechanical properties of beryllium copper in half hard and age hardened conditions

By JOHN T. RICHARDS
Chief Engineer
Penn Precision Products Inc.
Reading, Pa.

nite drop in hardness for thicknesses below 0.028 in., followed by a slight rise at 0.012 in.

Similar tests were conducted on beryllium copper strip. They showed the effect of thickness on the mechanical properties of half hard and age hardened strip. In both cases, tensile strength increases with a decrease in thickness. The pattern of all the hardness curves is similar in that a sudden drop occurs at thicknesses below 0.020 in., followed by a rise under 0.010 in. The increase is probably due to the hardness of the anvil of the testing machine.

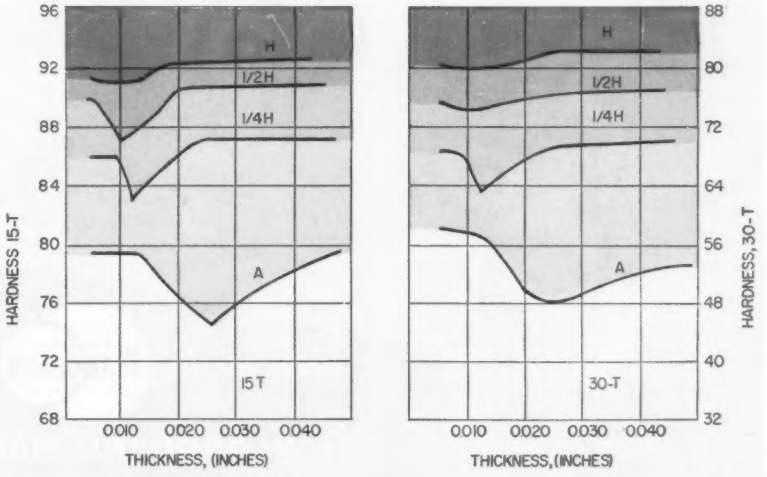
Temper — The hardness curves for 15T and 30T in commercial tempers reveal that the hardness drop is not only more pronounced in softer tempers, but occurs at heavier thicknesses. That is not surprising since deeper penetration would be expected in softer tempers.

In harder grades, the same proportion of penetration to thickness is reached only at thinner gages. Similarly, greater penetration in softer tempers will produce an anvil effect (subsequent rise in hardness) at heavier gages.

It is apparent that the effect of thickness is similar for the 15T and 30T tests. Since the hardness increments on the 30T scale are double those of the 15T, the drop in hardness is twice as great. The greater load penetrates deeper.

You can be misled by hardness tests. Depending on the alloy and temper, a drop in hardness occurs at thicknesses between 0.010 and 0.025 in., with no corresponding decrease in tensile strength.

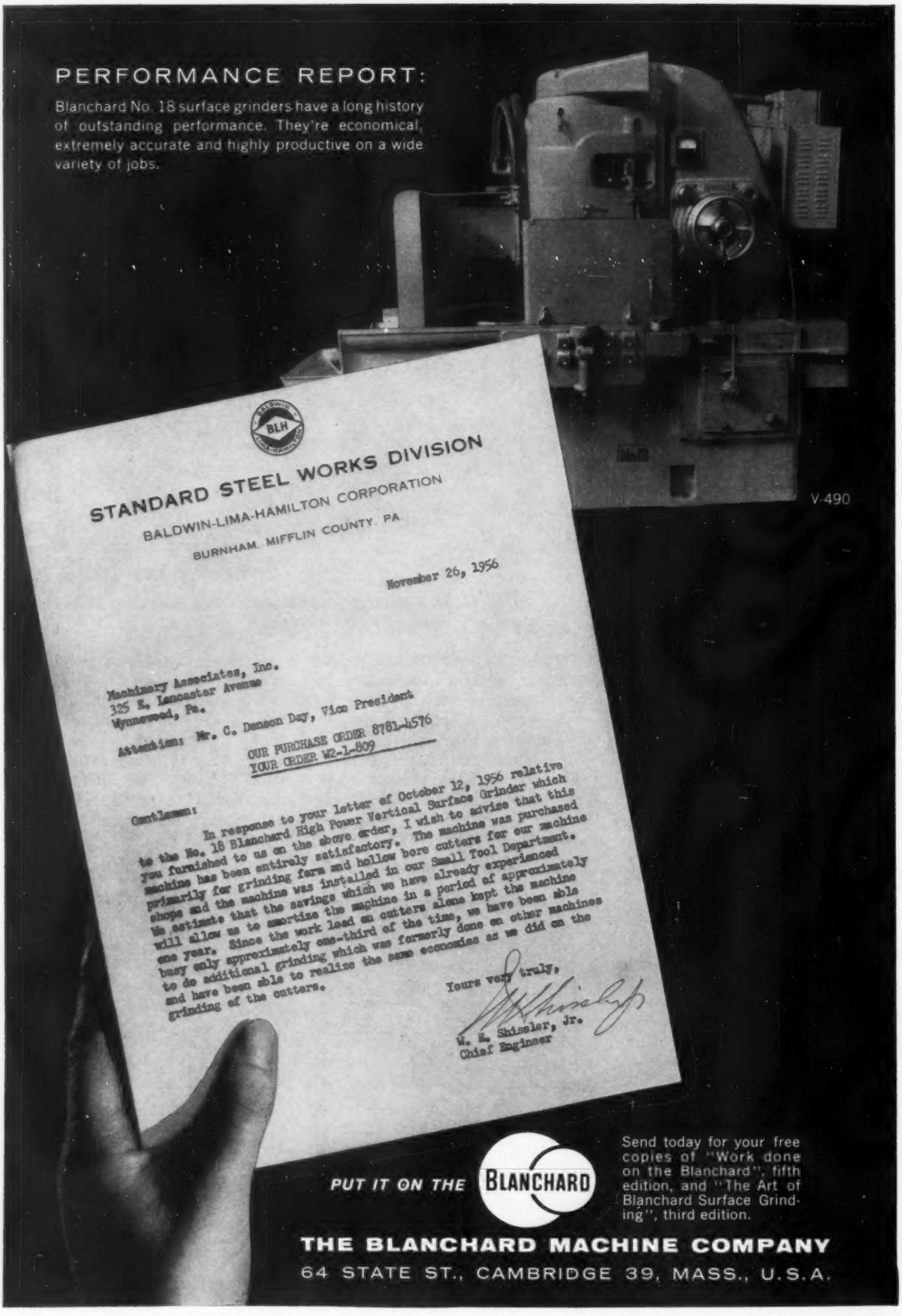
Hardness tests lack the sensitivity of tensile results.



The characteristic drop in hardness readings changes rolled temper. 15T and 30T tests are compared

PERFORMANCE REPORT:

Blanchard No. 18 surface grinders have a long history of outstanding performance. They're economical, extremely accurate and highly productive on a wide variety of jobs.


STANDARD STEEL WORKS DIVISION
BALDWIN-LIMA-HAMILTON CORPORATION
BURNHAM, MIFFLIN COUNTY, PA.
November 26, 1956
Machinery Associates, Inc.
325 E. Lancaster Avenue
Wynnewood, Pa.
Attention: Mr. C. Denson Day, Vice President
OUR PURCHASE ORDER 8781-4576
YOUR ORDER W2-1-809
Gentlemen:
In response to your letter of October 12, 1956 relative to the No. 18 Blanchard High Power Vertical Surface Grinder which you furnished to us on the above order, I wish to advise that this machine has been entirely satisfactory. The machine was purchased primarily for grinding form and hollow bore cutters for our machine shops and the machine was installed in our Small Tool Department. We estimate that the savings which we have already experienced will allow us to amortize the machine in a period of approximately one year. Since the work load on cutters alone kept the machine busy only approximately one-third of the time, we have been able to do additional grinding which was formerly done on other machines and have been able to realize the same economies as we did on the grinding of the cutters.
Yours very truly,
W. E. Shissler, Jr.
Chief Engineer
V-490

PUT IT ON THE BLANCHARD

Send today for your free copies of "Work done on the Blanchard", fifth edition, and "The Art of Blanchard Surface Grinding", third edition.

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

High Capacity Lift Truck Designed To Move Dies

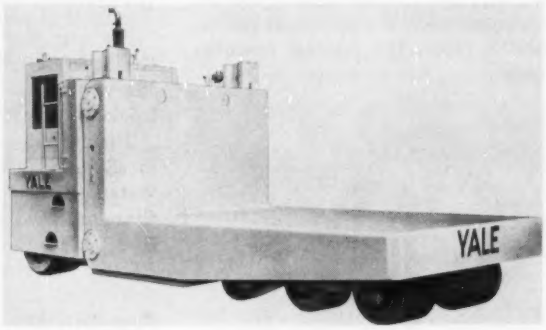
This industrial truck can handle loads up to 200,000 lb. It is powered by a diesel engine-generator unit.

The generator's normal output is 35 kw, maximum is 47.5 kw. Two motors power the four drive wheels.

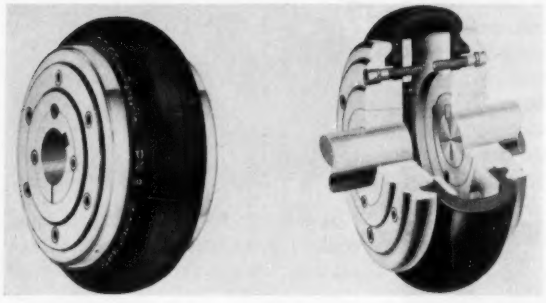
The drive wheels are 36 in. in diameter and have a 16-in. face.

The die carrying platform is 8 x 13 ft. The hydraulic lift raises it 28 in.

The truck is 21 ft 4 in. long and it weighs 77,000 lb. *Write*: Yale Materials Handling Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. *Phone*: Orchard 3-1200



Flexible Cushion Coupling Uses Rubber Tire



Para-flex will take angular misalignment of 4 degrees, parallel misalignment up to 1/8-in. and up to 5/16-in. of end float. The unit also cushions shock loads and diminishes torsional vibration—protects the driver and the driven machine.

Heart of the coupling is a tire with synthetic tension members bonded in rubber. The tire is clamped between two hubs which are mounted on the shafts to be coupled.

Capacities of the coupling go up to 600 hp at 900 rpm. *Write*: Dodge Mfg. Corp., Mishawaka, Ind. *Phone*: Blackburn 9-2421

Optical Projection Grinder Gives Smooth Finishes

Model VG-3 form grinds steel and tungsten carbide to precision tolerances without the need to stop and check a comparator.

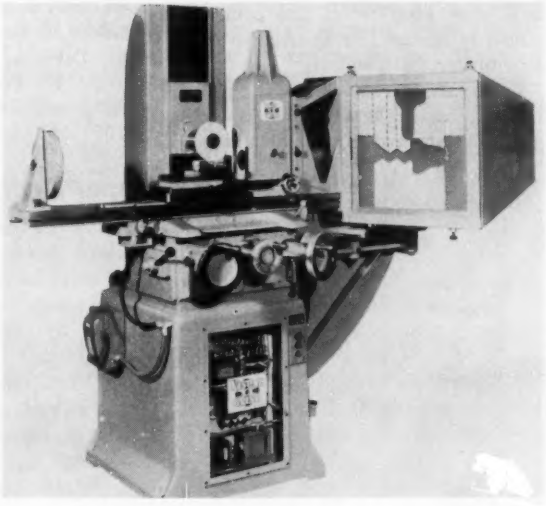
Through, blind and combination grinding methods facilitate continuous grinding and work inspection of intricate forms.

The workpiece is projected and inspected on a viewing screen while being ground. Magnification systems range from 10:1 to 100:1.

A nylon timer belt (oil protected) is used to give a smooth finish to the part. Numerous forms can be generated by using a few wheels.

The continuous lubricating system incorporates a low pressure rotary pump that keeps a constant film on the machine ways.

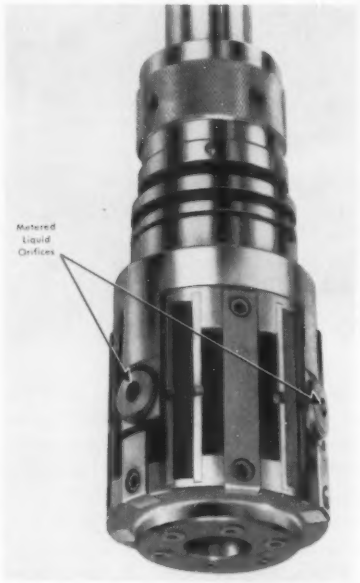
A 110-volt electrical control operates from 220 or 440 volts. A transformer is used to operate the working light. *Write*: Cleveland Grinding Machine Co., 1610 Eddy Rd., Cleveland 12, O. *Phone*: Liberty 1-4040



NEW PRODUCTS and equipment

Liquid Sizing

Honed bores are sized by metering liquid directed against the cylinder wall through orifices in this honing tool. When a preselected pressure point is reached, a microswitch stops the honing machine cycle.



This method gages the diameter of honed bores throughout their length. *Write*: Barnes Drill Co., 854 Chestnut St., Rockford, Ill. *Phone*: 4-8661

Electric Trucks

The braking system employed in these trucks allows them to come to a slow stop when the control handle is released or allowed to return to vertical position.

There are three speeds in both forward and reverse. First speed is a coasting position for accurately spotting loads. Second speed is low, third is high.

The "walkies" are available in capacities to 6000 lb. *Write*: Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass. *Phone*: Watertown 4-5400

Industrial Greases

An organic thickener stabilizes the Rykon line of greases. Capillary action of the fibers in the thickening agent holds the oil.

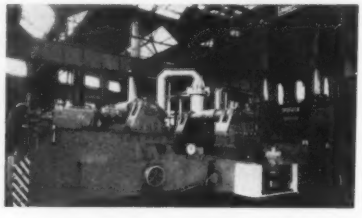
The dropping point of the greases is 480°F. They are resistant to water and oxidation. *Write*: Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago 80, Ill. *Phone*: Harrison 7-9200

Forging Manipulator

Carrying capacities of 5500 to 220,000 lb are provided by various models of this manipulator. All movements are hydraulic.

One or two pressure pumps (depending on the size of the manipulator) driven by electric motors deliver water to an accumulator at 1420 psi.

From the accumulator, the pressure water goes to the control center which supplies it to the various working cylinders as needed.



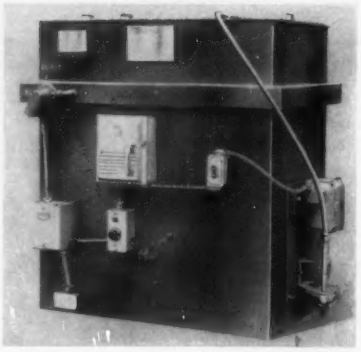
All movements are uniformly variable. *Write*: Industrial Equipment Division, Kurt Orban Co. Inc., 22 W. Putnam Ave., Greenwich, Conn. *Phone*: Normandy 1-6100

Vapor Degreaser

Model 75 uses trichlorethylene solvents to clean from 600 to 900 lb of steel an hour.

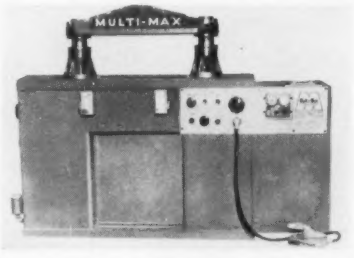
The electric heater load is controlled by magnetic contactors. The unit uses 220 or 440 volts.

Self-distilling of solvent assures fresh solvent for spraying. The boiling sump requires 16 gallons and 24 gallons are needed in storage. Water consumption: 30 gallons an hour. *Write*: Aircon Division, Armstrong & White Inc., 135 Freeport Rd., Cheswick, Pa.



Punch Press

Material can be fed into this machine from front to back, back to front and side to side. Capacities range from 40 to 125 tons, speeds from 40 to 1000 strokes a minute.

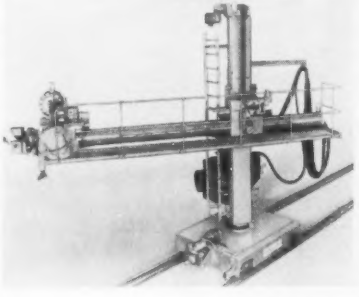


A locking device on the left hand control provides safe one-hand operation. A power failure shuts off the machine. *Write*: Diamond Machine Tool Corp., Pico, Calif. *Phone*: Raymond 3-8254

Welding Manipulator

A "catwalk" is supplied with this welding manipulator in place of the operator's pulpit. This allows inspection of the piece during welding.

It has an arc height of 12 ft and a horizontal arc travel of 12 ft (measured from the edge of the



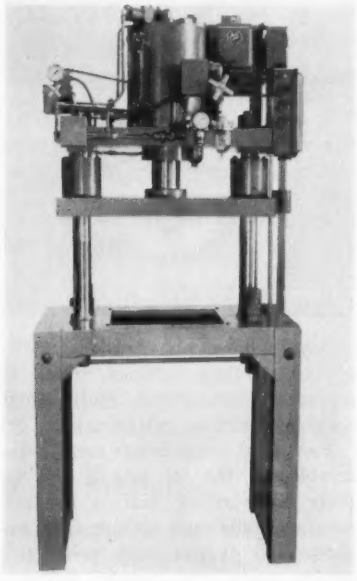
car out). The travel car is self-propelled and the column can be rotated manually through 360 degrees.

Welding head manipulators are available in three different series. *Write*: Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo. *Phone*: Prospect 6-6893

Press Trims Diecastings

This 20-ton hydraulic press is operated by a 3-hp motor. Top approach speed is 1200 ipm, return speed 450 ipm. The stroke is adjustable up to 12 in.

Off-center loading is made possible by parallel strain rods, moving platen and heavy duty guide bearings.

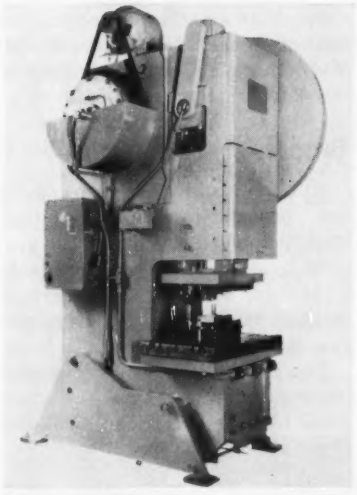


The press can also be used for staking, swaging, stamping, shearing, blanking, forming and as a dwell press for curing or holding operations. *Write*: Buffalo Metal Container Corp., 75 Meadow Rd., Buffalo 16. N.Y. *Phone*: Bailey 3944

Gap Press

This press is made in four capacities: 75, 110, 150 and 200 tons. It is used for blanking, forming, drawing, bending and assembling.

It has a vee-belt motor drive with electric pushbutton safety controls.



The clutch control has off, once, inch and continuous operation positions. *Write*: A. B. Farquhar Division, Oliver Corp., 126 Duke St., York, Pa. *Phone*: 7801

Clamp for Electric Cords

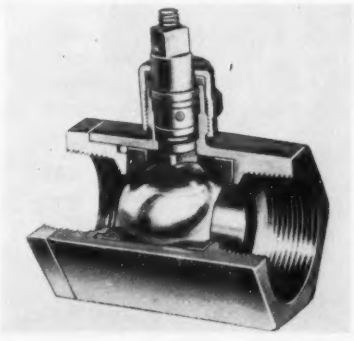
The Speed Clip secures midrip cord used in electrical appliances. It provides strain relief for two or three wire power cords with a section of about 3/16 x 7/16 in.

The one-piece clamp is held by a single screw or rivet. Flanged edges prevent wire chafing and a dimpled leg permits the use of 115 or 230-volt cord. *Write*: Tinnerman Products Inc., 8700 Brookpark Rd., Cleveland, O. *Phone*: Shadyside 1-9300

Vacuum Ball Valves

These valves (sizes from ¼ to 6 in.) will hold vacuum in either direction. They may be mounted in any position and operated manually or by air motor.

The valves are made of bronze, aluminum, mild steel, stainless steel or polyvinyl chloride.



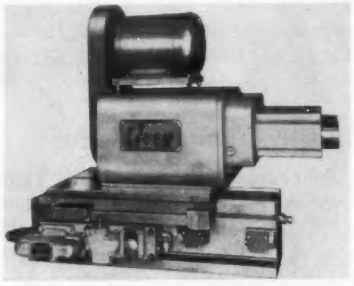
In the full open position, the cross section is circular and approximates the size of the connecting pipes. *Write*: NRC Equipment Corp., 160 Charlemont St., Newton Highlands 61, Mass. *Phone*: Decatur 2-5800

Way-Type Unit

The Hydro-Way does heavy duty drilling, reaming, spotfacing, boring and counterboring, milling, and chamfering.

Its specifications include 5 to 20 hp, 12,000 lb maximum thrust, and nonmetallic ways.

This unit has a 12 in. travel and adjustable coarse, fine and jump feeds. It is a building block



unit that may be mounted horizontally, vertically or on an angle. *Write*: Avey Division, Motch & Merryweather Machinery Co., Box 625, Cincinnati 1, O. *Phone*: Utah 1-1515

Valves for Liquid Oxygen

This line of stainless steel gate and globe valves operates at around −300°F and at pressures of 150 to 600 psi.

Extended bonnets permit use of heavy insulation between the operating mechanism and the pipeline. This prevents heat pickup.

Valve sizes are from ½ to 12 in. *Write*: Cooper Alloy Corp., Hillside, N. J. *Phone*: Murdock 8-4120

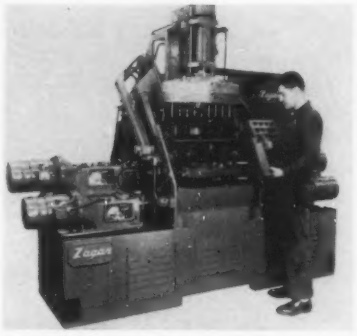
Transfer Machine

Multihole drilling, reaming and tapping (from three sides) are done by this trunnion-type machine.

Tooling adjusts to parts from 12 to 24 in. Machine cycling is automatic and electrically interlocked.

Hydraulic units feed multispindle

NEW PRODUCTS and equipment

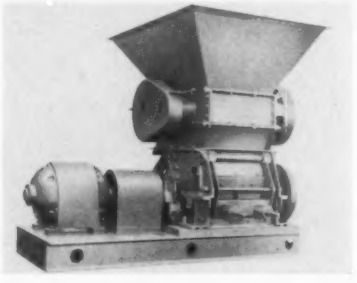


gearless heads for multihole machining. Mechanical drilling units located on the sides of the machine do single spindle drilling and reaming. *Write*: Zagar Inc., 24000 Lakeland Blvd., Cleveland 23, O. *Phone*: Redwood 1-0500

Metal Turnings Feeder

Dual star wheels of this unit feed metal turnings into a crusher until the ampere demand controls signals "enough." The feed shuts down temporarily until the surge load has passed.

The feeder motor can be started under a full load allowing the hopper (capacity, 2 to 3 cu yd) to double as a storage bin. The hopper will fit crushers with capacities of 1 to 20 tons an hour. *Write*: Jeffrey Mfg. Co., Columbus 16, O. *Phone*: Axminster 4-3331



Induction Heaters

This line of electronic heaters comes in 15, 30 and 40 kw ratings. Each heater can be custom designed.

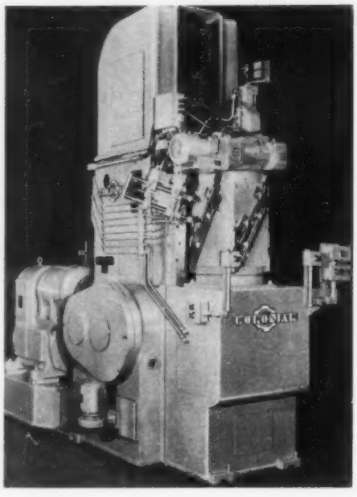
The power tubes provide liberal overload capacity in the oscillator and rectifier sections.

Protective devices include water flow and thermal switches, filament time delay, overload relays and door and coil interlocks. *Write*: Magnethermic Corp., Youngstown, O. *Phone*: Sterling 8-9661

Broacher Is Fast

Automotive rocker arm shafts are probed for true position, broached and ejected in nine seconds by this 10-ton machine with a 160 in. stroke. The vertical machine surface broaches eight oil grooves at a time.

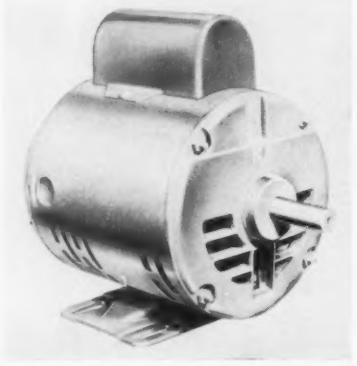
The broacher has a four-station indexing fixture. Each fixture holds two parts which are broached at the same time.



Production rate: 640 an hour at 80 per cent efficiency. *Write*: Colonial Broach & Machine Co., P. O. Box 37, Harper Station, Detroit 13, Mich. *Phone*: Jefferson 6-2550

Motors Rerated

Using aluminum in place of cast iron has reduced the weight of these motors.

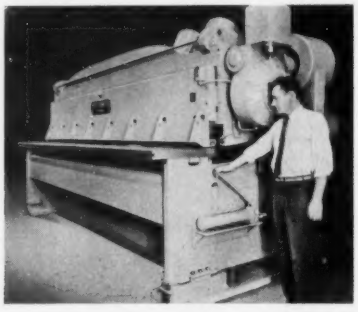


They have ratings from ⅛ to 1 hp in polyphase, capacitor single phase, permanent split capacitor and (in the smaller ranges) split phase types.

The motors use NEMA frames 56 and 48. *Write*: Robbins & Myers Inc., Springfield, O. *Phone*: 3-6461.

Shear for Wire Mesh

Manual horizontal adjustment over an 8 in. range is possible with this unit, equipped to shear wire mesh used to reinforce concrete.



A heavy steel torque tube gives this machine a capacity of 49 wires (0.394 in. diameter). *Write*: Cincinnati Shaper Co., Hopple, Garrard and Elam streets, Cincinnati 25, O. *Phone*: Kirby 1-5010

Cranes

Available in capacities from 1 to 10 tons, these cranes may be adapted to spans up to 50 ft. They may be hand or motor driven.

Packaged components can be assembled at the job site if a completely assembled unit is not desired. Individual components include end trucks with necessary bridge beam attachment fittings, motor drive parts, controls and electrification equipment. *Write*: Becker Crane & Conveyor Co., 4900 Ridge Rd., Cleveland 9, O. *Phone*: Shadyside 9-2733

Powder Blower

Magnaflux powder can be applied with this blower. The particles cover the entire area being tested and give a clear indication when cracks are present.

The blower weighs 2¼-lb when empty and comes with an adjustment for controlling the density of the cloud of powder. *Write*: Mag-

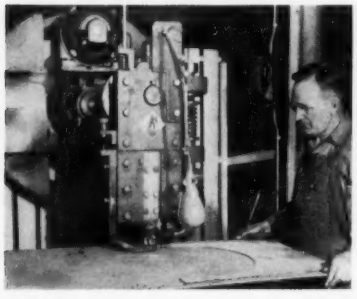
NEW PRODUCTS and equipment

naflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill. *Phone*: Underhill 7-8000

Nibbling Machine

This machine cuts its own templates, circles and other metal shapes. It slots and cuts tubing.

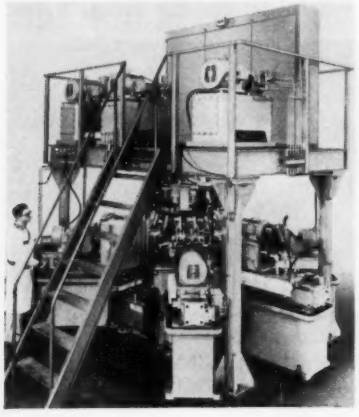
Two types come in nine sizes ranging from 12 to 36 in. throats. The nibbler can cut metal up to ¾-in. thick.



Material cut by this machine generally does not need to be filed or finished. *Write*: W. J. Savage Co., Knoxville, Tenn. *Phone*: 2-6168

Index Machine

This machine spot faces, reams and bores the sintered iron bore and thrust face of 6 in. diameter water pump impellers at a production rate of 700 pieces an hour with 80 per cent efficiency.



It adapts to a variety of machining operations on large and small parts. The rotary index machine has eight stations, is 14 ft high. It occupies floor space about 12 ft in diameter.

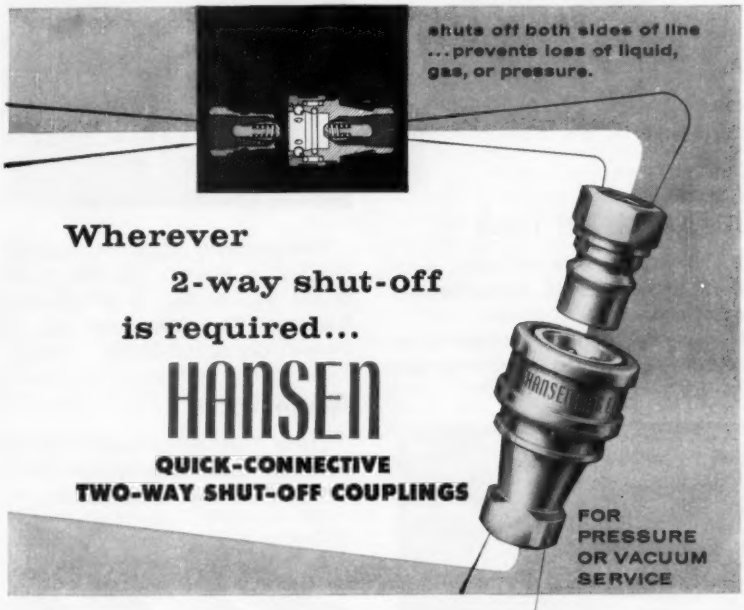
All electrical and hydraulic controls are on a platform above the machine.

Parts are centered by 16 overcenter toggle type clamping fixtures. *Write*: Expert Automation Machine Co., 17144 Mt. Elliott Ave., Detroit 12, Mich. *Phone*: Twinbrook 1-4327

Air Cleaner

These cleaners are installed in industrial forced-air heating, cooling, or ventilating systems to remove dust, dirt, pollen, smoke and other foreign matter.

They are equipped with automatic or manually controlled self-cleaners and come in a large range of capacities. *Write*: Electro-Air Clean-



To connect a Hansen Two-Way Shut-Off Coupling, you merely pull back the sleeve and push the Plug into the Socket. To disconnect, just pull back the sleeve. No tools required. When Coupling is disconnected, similar valves in Socket and Plug shut off both ends of line—practically eliminate spilling of liquid or escape of gas at instant of disconnection.

Hansen Series HK Two-Way Shut-Off Couplings are available with female pipe thread connections from ⅛" to 1" inclusive. Available in brass or steel. Sizes generally required for L-P Gas service have approval of Underwriters' Laboratories.

WRITE FOR THE HANSEN CATALOG

Here's an always ready reference when you want information on couplings in a hurry. Lists complete range of sizes of Hansen One-Way Shut-Off, Two-Way Shut-Off, and Straight-Through Couplings—including Special Service Couplings for Steam, Oxygen, Acetylene, etc.

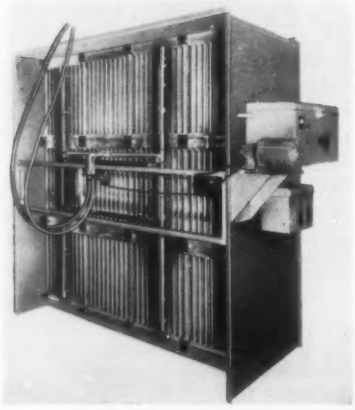
REPRESENTATIVES IN PRINCIPAL CITIES

SINCE 1915 QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

NEW PRODUCTS and equipment



er Co. Inc., 1285 Reedsdale St., Pittsburgh 33, Pa. *Phone*: Fairfax 1-0994

10,000-Lb Lift Truck

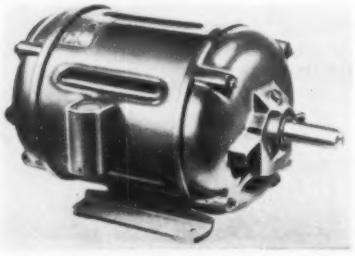
This lift truck is for heavy duty work in steel mills, factories and warehouses.

Power is supplied by 230 cu in. engines (diesel, gasoline or LP-gas fuel).

A roller type mast gives more lift without increasing the lowered height of the unit. *Write*: Allis-Chalmers Mfg. Co., Milwaukee, Wis. *Phone*: Spring 4-3600

Motor Frames Changed

These induction, single-phase motors, in integral ratings of 1 through 5 hp, come in new NEMA frames 182 through 254U.



These frames make the repulsion-start motors interchangeable with capacitor-start and small polyphase motors of the same ratings. *Write*: Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo. *Phone*: Parkview 1-5000

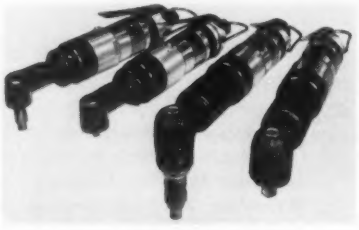
2000-Lb Lift Truck

This lift truck has a turning radius of 68 in. It has self-adjusting brakes and an independent seat-operated parking brake.

The maximum lift speed (loaded) is 42 ft a minute. It has a lift height of 130 in. *Write*: Baker-Raulang Co., Cleveland 2, O. *Phone*: Olympic 1-3000

Angle Tools

These four attachments are for production fastening in close quarters and hard to reach places.

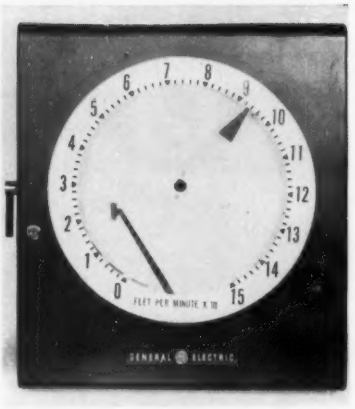


They are heavy or light duty angle screw drivers and nut setters. *Write*: Gardner-Denver Co., Quincy, Ill. *Phone*: 551

Recorder

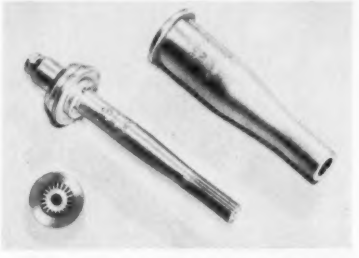
Speed is measured and recorded by this unit with an accuracy of ±0.1 per cent. It is used with direct current tachometer generators and can be calibrated in revolutions per minute, feet per minute or other speeds.

High accuracy results from measuring the difference between the tachometer voltage and a voltage from a precision reference contained in the instrument. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211



Nozzles for Flame Cutting

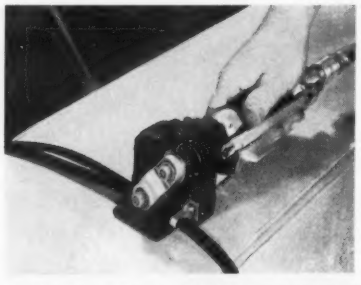
This two-piece nozzle has 12 to 20 small outlets for preheat gases. It is for flame cutting with oxygen and fuel gases.



The nozzles are cleaned with a cloth or soft wire brush. *Write*: Linde Co., division of Union Carbide Corp., 30 East 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-8000

Strap Stretcher

This air-powered stretcher for steel strapping weighs less than 4 lb. Unlimited take-up and pneumatically controlled tension reduce operator fatigue and errors. *Write*:



Brainard Steel Division, Sharon Steel Corp., 390 Griswold St., Warren, O. *Phone*: 2154-1

NEW Literature

Write directly to the company for a copy

Valves

A series of injection molded valves and fittings is described in this 4-page bulletin. Mirenda Corp., 253 Battle Ave., White Plains, N.Y.

Furnace Electrodes

Submerged electrodes which are removable are described in bulletin 810, 4-pages. Ajax Electric Co., Frankford at Delaware avenue, Philadelphia 23, Pa.

Wrought High-Temp Alloys

Precipitation-hardening materials for high temperature applications are discussed in DB-52-250, a 4-page bulletin. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

Abrasion Resistant Steel

This 4-page bulletin, 11-3, includes information on fabrication and heat treatment of a steel with a special balanced composition for hardness and ductility. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Turret Lathes

A 24-page bulletin, VTL-3, describes 32, 42 and 52-in. vertical turret lathes. Kaukauna Machine & Foundry Division, Giddings & Lewis Machine Tool Co., Kaukauna, Wis.

Gray Iron

Pig iron and foundry coke in the production of gray iron are reviewed in this 20-page bulletin. Pittsburgh Coke & Chemical Co., Pittsburgh 19, Pa.

Thermostats

A temperature conversion chart is included in bulletin 8400, 4 pages, which describes the temperature ranges, ratings, mountings and terminal arrangements of bimetal thermostats. Stevens Mfg. Co. Inc., 45 N. Plymouth St., Lexington, O.

Flexible Hoses

Bulletin 70, 8 pages, describes hose and duct products. Flexaust Co., 100 Park Ave., New York 17, N.Y.

Meters

A 4-page bulletin, 94/10, contains specifications of a stainless steel meter for liquids. Neptune Meter Co., 19 W. 50th St., New York 20, N.Y.

Steel Price Chart

Here's a slide chart calculator for steel prices in the New England area. W. E. Clark & Co. Inc., 3 Charlton St., Everett 49, Mass.

Honing Tools

Slotted, flange, horizontal and plate type honing tools and their abrasive stone mountings are discussed in bulletin 570, 4 pages. Barnes Drill Co., Rockford, Ill.

Tool Catalog

A 120-page general catalog includes wrenches, clamps and toolholders. Armstrong Bros. Tool Co., 5200 W. Armstrong Ave., Chicago 30, Ill.

Chemical Resistant Sheet

Saraloy 898 is a flexible thermoplastic sheet used to line storage tanks, processing tanks, fume ducts and hoods—18 pages. Plastics Department, Dow Chemical Co., Midland, Mich.

Material Handling Trucks

Fork lift trucks, straddle carriers, powered hand trucks and towing tractors are included in a 16-page bulletin. Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich.

Exothermic Products

Liquidizers and fluxes are discussed as exothermic additives in this 8-page bulletin, B-101-57. Pittsburgh Metals Purifying Co. Inc., 1352 Marvista St., Pittsburgh 12, Pa.

Lubricants

Molybdenum disulphide lubricants and their physical and chemical properties are discussed in this 16-page bulletin. Alpha Molykote Corp., 65 Harvard Ave., Stamford, Conn.

Water Treatment

Coagulant aids for use in industrial water clarification and waste water treatment systems are described in this 4-page bulletin. Hagen Chemicals & Controls Inc., 323 Fourth Ave., Pittsburgh, Pa.

Fittings

Quantities and sizes of packaged fittings are outlined in this 4-page bulletin. W-S Fittings Division, H. K. Porter Company Inc., Box 95, Roselle, N.J.

Steel Buildings

This 4-page bulletin, SX-11557, describes the Steelox panel method of construction. Armco Drainage & Metal Products Inc., Middletown, O.

High-Temp Brazing Alloys

This 2-page bulletin discusses 11 alloys and their properties with recommended brazing temperatures. Stainless Processing Division, Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Stamping Equipment

Feeding devices and special attachments are described in a 4-page bulletin on roll leaf stamping machines. Olsenmark Corp., 124-32 White St., New York 13, N.Y.

Furnaces

The forced convection heating principle used by a pusher furnace for heat treating is explained in this 2-page bulletin, P57. Ipsen Industries Inc., 721 S. Main St., Rockford, Ill.

Coolants

The selection of tool lubricants and grinding coolants is described in this 12-page bulletin. Van Straaten Chemical Co., 630 W. Washington St., Chicago 6, Ill.

Pumps

This bulletin, 7062-C, uses cross-sectional drawings, selection charts and dimension tables to describe general purpose pumps. Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y.

Tumblasts

Bulletins 136-D, 131-D, 133-D and 110-D describe 15, 36, 48 and 60-in. blast cleaning machines. Wheelabrator Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Separator

A graphite entrainment separator is described in this 4-page bulletin, S-6900. National Carbon Co., 30 E. 42nd St., New York 17, N.Y.

Diagonal Gear Shaving

The diagonal gear shaving process is described in this 8-page bulletin, S-57-2. Tables are included for 8, 12 and 18-in. machines. National Broach & Machine Co., 5600 St. Jean, Detroit 13, Mich.

Fire Protection

Automatic sprinkler systems are explained in an 8-page bulletin. Automatic Sprinkler Corp. of America, Youngstown 1, O.

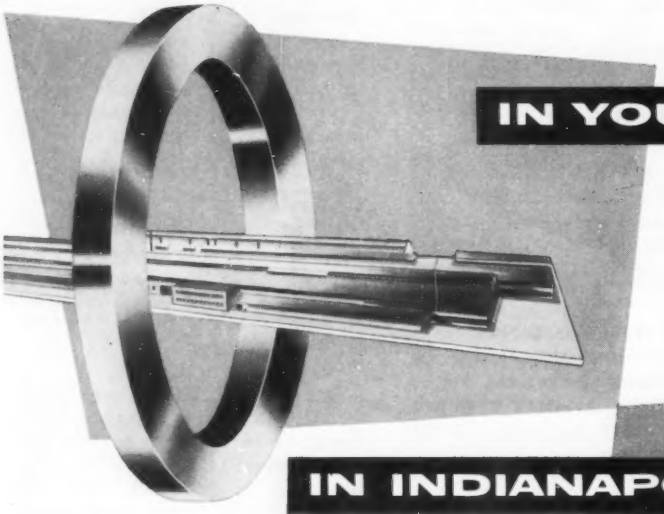
Casting

A series of bulletins outlines case histories of investment castings applications. Alloy Precision Castings Co., 3855 W. 150th St., Cleveland 11, O.

TRY CMP's 3 IN 1 SERVICE

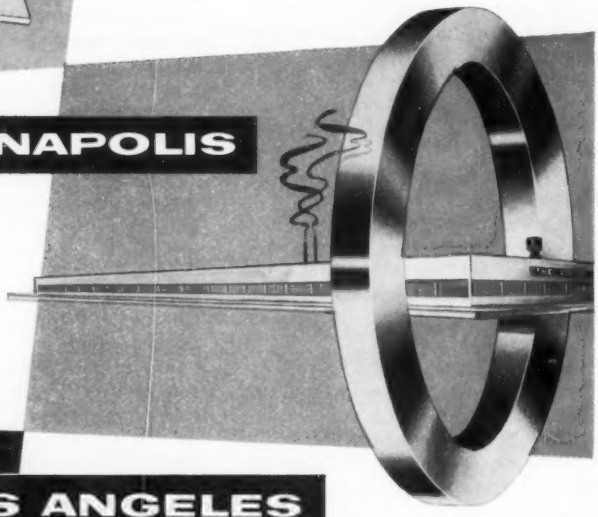
FOR RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

Now there are 3 CMP plants equipped with today's most effective rolling and processing facilities for the production of "restricted specification" cold rolled strip steel. Strategic plant locations provide CMP customers with the security of 3 sources of supply, plus the opportunity for close working relationships which these local production centers make possible.



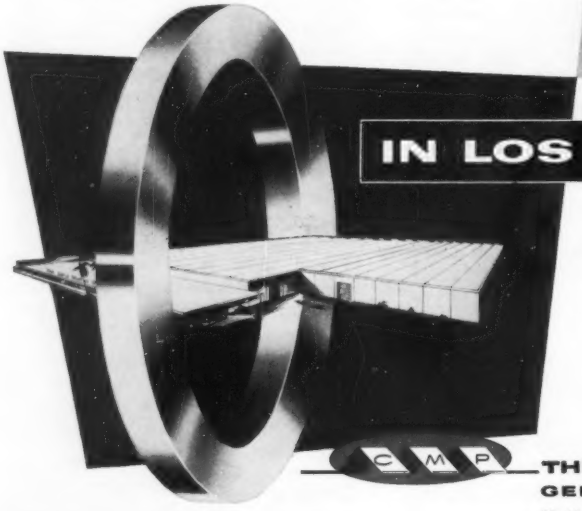
IN YOUNGSTOWN

General office headquarters and production facilities where CMP pioneered the processing of "restricted specification" cold rolled strip steel. Laboratory and research facilities are also here, staffed for continuing development and improvement of CMP products.



IN INDIANAPOLIS

Geographically situated to conveniently serve the fast growing midwestern market for specialized cold rolled strip, this recently built, all-new plant utilizes identical processing equipment as other CMP plants for producing a wide range of "restricted specification" cold rolled strip.



IN LOS ANGELES

Latest addition to CMP's producing facilities is this Los Angeles unit, the only plant in the West with CMP-type equipment. Faster service for West Coast steel fabricators, plus the know-how of steel mill-trained personnel provide a service opportunity not heretofore locally available.

Try CMP for 3 in 1 Service

Low Carbon, High Carbon — Annealed or Tempered, Stainless, Alloy, Electro Zinc Coated

THE COLD METAL PRODUCTS CO.
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: NEW YORK - CLEVELAND - DETROIT - INDIANAPOLIS
CHICAGO - LOS ANGELES - SAN FRANCISCO

STEEL

July 1, 1957

Market Outlook

BUT for the general upward revision in prices, there's not likely to be much activity in the steel markets over the next several weeks. Expectations are that the year's low points in production and consumption will be hit over the July 4 holiday.

The vacation impact on the markets will be greatest the next couple of weeks. But sluggishness will be felt through the summer. Manufacturing suspensions — started in mass this week—will extend through August.

STEEL OPERATIONS— Ingot production will slip several points over the holiday. It will not be surprising if a lower pace continues through July. Curtailments at the finishing mills may be even more severe than they are in primary steel. Some steelmakers will close certain departments one or two weeks.

Most steel mill vacations will be staggered, except where down time is required for equipment repairs and new installations. Currently, the national ingot rate is 86 per cent of capacity, off 2 points from that of a week ago and the lowest since mid-May.

DEMAND LAGGING— Pressure for steel, except sheared plates and wide flange beams, is off. Even heavy standard structurals are under no great strain. And oil country pipe is not as active as it was recently. Tin plate is moving briskly on old orders. Sheets and bars are sluggish, though demand for bars appeared slightly more active last week.

Consumers seem chiefly concerned with short term commitments. But a slight tightening in over-all supply could quickly bring long term buying back into the picture.

SUPPLIES ADEQUATE— At the moment, there isn't much concern over the adequacy of supplies. It is figured that demand can be accommodated by accelerated output before or immediately after vacation closings. There wasn't much hedge buying against the midyear price increase because most consumers were confident their ordinary needs could be promptly satisfied. Also, inventories in some areas have been substantial.

LOW USE MONTH— July is likely to prove to be the low point in steel consumption this year. Two reasons: Widespread scheduling of manufacturing plant vacation suspensions, and reduced assemblies of automobiles in the between-model period. Some buying of steel for 1958 model accessories was reported last week.

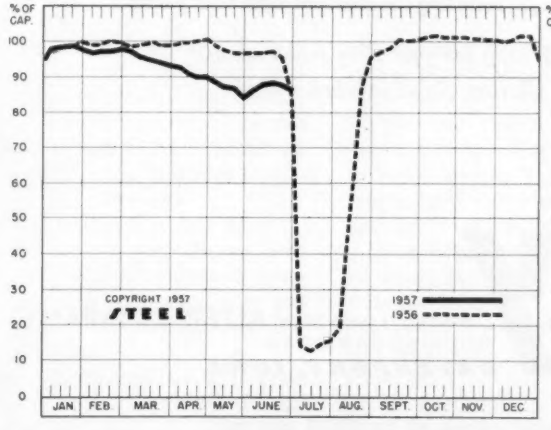
Mill tonnage carry-overs from the second to third quarters will be normal operating ones in most products.

PRICE HIKE FEATURES— Chief market interest of late has centered on the size of the anticipated price increase. Most observers figured it would average $5 to $6 a ton. Steelmakers felt it ought to be $8 to $10 since the automatic wage boost on July 1 (17.1 cents per man-hour) will up steel costs about $10.26 a ton.

New prices do not become effective before July 1, so STEEL's finished product composite held at $140.24 last week.

SCRAP WEAKER— Although STEEL's composite on the steelmaking grades of scrap advanced another 16 cents to $55.83, highest since the end of January, the market tone is weaker.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

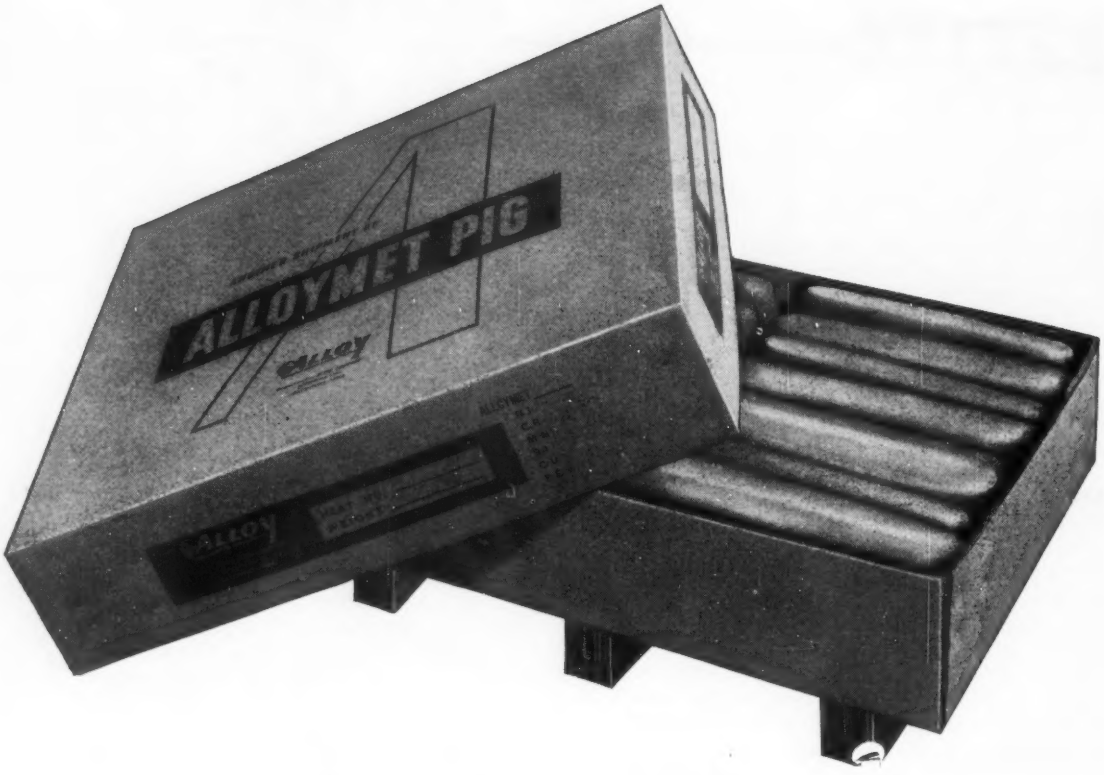
	Week Ended June 30	Change	Same 1956	Week 1955
Pittsburgh	90.5	+ 3*	92.5	74.5
Chicago	86	+ 1.5*	82	72.5
Mid-Atlantic	93.5	— 1	75	74
Youngstown	80	0	100	80
Wheeling	82.5	— 1	93	88
Cleveland	90	+ 3*	88.5	73.5
Buffalo	105.5	0	105	80
Birmingham	92.5	0	23.5	96
New England	52	— 4	86	85
Cincinnati	79.5	+ 0.5*	90	81
St. Louis	79	+22.5	94.5	106
Detroit	114	+14	105	80
Western	100	— 1	105	105
National Rate	86	— 2	85	71

INGOT PRODUCTION‡

	Week Ended June 30	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	138.2†	135.8	140.2	131.6
NET TONS (In thousands)	2,220†	2,181	2,252	2,114

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 27 Technical Outlook—p. 65



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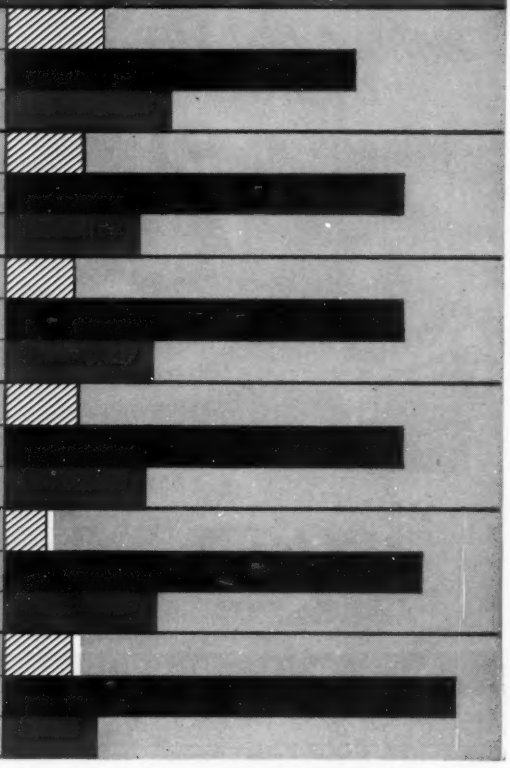
COMPONENTS	PRESENT LEVEL COMPARED TO 3 MONTHS AGO		Third Quarter Forecast
CASTINGS[1]	18%	HIGHER	16%
	54%	SAME	57%
	28%	LOWER	27%
OTHER FORMED COMPONENTS[2]	13%	HIGHER	13%
	62%	SAME	65%
	25%	LOWER	22%
MACHINED COMPONENTS[3]	11%	HIGHER	11%
	65%	SAME	65%
	24%	LOWER	24%
FASTENERS	9%	HIGHER	12%
	59%	SAME	65%
	32%	LOWER	23%
ELECTRICAL EQUIPMENT AND MOTORS	10%	HIGHER	7%
	71%	SAME	68%
	19%	LOWER	25%
MECHANICAL RUBBER GOODS AND BELTING	8%	HIGHER	11%
	74%	SAME	74%
	18%	LOWER	15%



[1]Die, gray iron, malleable, nonferrous, steel.
[2]Forgings, stampings, springs, wire shapes.
[3]Bearings, couplings, cylinders, gears, screw machine products.

Left column shows percentages of PAs in STEEL's survey whose current inventories are higher, the same or lower than those of three months ago. Right column figures and bar graphs show how the buyers think their stocks will change three months hence

Buyers Forecast Stable Inventories

REVERSAL of the trend toward lower stocks of major industrial components is forecast by STEEL's latest quarterly survey. Guarded optimism among purchasing agents will be reflected by stable or slightly increased inventories.

A summary of the data presented above shows that 65 per cent of the buyers will maintain present stocks; 12 per cent will add to them; and 23 per cent will continue cutbacks.

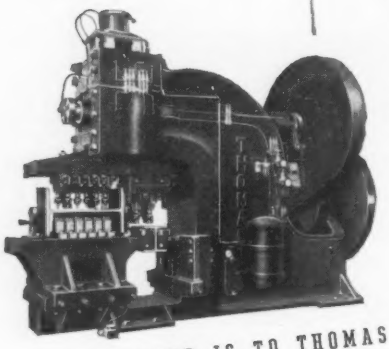
Fears Unfounded — The grim prophecies of a previous survey (see STEEL, Apr. 1, p. 133) were not fulfilled. Although 30 per cent of the buyers anticipated lower inventories three months ago, only 24 per cent now report that they reduced stocks. Higher inventories, forecast by only 7 per cent of the respondents three months ago, are now reported by 12 per cent.

In castings, especially, anticipated stock reductions failed to materialize. Only 28 per cent of the buyers cut inventories, although 36 per cent were prepared to do so. More than 18 per cent of the respondents increased their supplies of castings during the period, despite predictions that only 9 per cent would.

Fasteners Unstable—While only 2 per cent of the buyers in STEEL's previous survey anticipated higher levels in this category, 9 per cent now report that stocks exceed those of three months ago. Twenty-seven per cent of the respondents estimated they would have lower inventories, but 32 per cent now report diminished stocks. Outlook for fasteners: Greater stability.

Only in electrical equipment (solenoids, relays, switches and resistors) and smaller electric mo-

BEAM PUNCHING
without tool change



THE newly designed Thomas Beam Punches are built in sizes to handle beams up to 12"-18"-24"-30" and 36", web and flange punching, with a single tool set-up. Any of the five sizes may be used with or without a Thomas spacing Table, depending on production needs.

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MACHINE MANUFACTURING CO.
PITTSBURGH 33, PA.

• *Write for further information*

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

51 a

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•

(Left) "Illustrating the 15 ft. reach collector. Handles large or small work. Units available with 9 ft., 15 ft., 17 ft. and 20 ft. reach."

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tors will there be a continuing emphasis on inventory reduction, the buyers indicate.

30 to 60 Days—Most manufacturers continue to hold 30 to 60 day inventories of the major components. A decision by 53 per cent of the respondents to stock mechanical rubber goods and belting at this level signals a departure from the last quarter's practice—only 27 per cent had such inventories, and 33 per cent favored 10 to 30 day stocks.

Deliveries are considered satisfactory by 97 per cent of the buyers. Minor difficulties are noted in these areas: Antifriction bearings (11 per cent have trouble); steel castings (10 per cent); gears (5 per cent).

Tool Steel . . .

Tool Steel Prices, Page 113

Prices on tool steel are expected to hold until fall despite advances on other grades. Any mark ups on tool steel are expected to be delayed until around Oct. 1.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 110 & 111

Producers of sheets and strip steel enter July with rolling capacity still open for that month. July specifications probably will be the lightest this year. This is ascribed to vacations and some advance buying for June shipment because of the probability of higher prices after midyear.

Dullness applies not only to major tonnage items (hot and cold-rolled sheets, galvanized sheets) but also to specialties. Possibly the only exception is high silicon sheets and even in this line some spottiness has developed.

For the first time in many months producers have been able to turn out flat-rolled tonnages on a comparatively short lead time. They accepted some rollings as late as June 15 for shipment before July 1.

Mills' order backlogs are low for July, but production and shipments will be off sharply from those in the month just ended. Bookings probably will be high as moderately improved production is expected in August.

Sheetmakers say developments

in the auto industry will have a strong bearing on fourth quarter business. Favorable public acceptance of the 1958 models should result in more active demand for steel. Appliance manufacturers also may be back in the sheet market on a more active basis soon. Their inventories are low and any pickup in appliance demand would be reflected quickly at the manufacturing end.

On the West Coast, almost all sheet mills will shut down for vacations during July and August. A few will remain in operation on a staggered production schedule. An August sales gain is seen.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 112

Screw orders for aircraft are heavier. Contracts totaling $183,378 have been let for the Air Force base at Topeka, Kans. These went to: Reed & Prince Mfg. Co., Worcester, Mass., $53,812; Screw Corp. of California, Los Angeles, $52,230; Aero-O-Line Mfg. & Supply Co., Burbank, Calif., $48,241; American Screw Co., Willimantic, Conn., $29,095.

Plates . . .

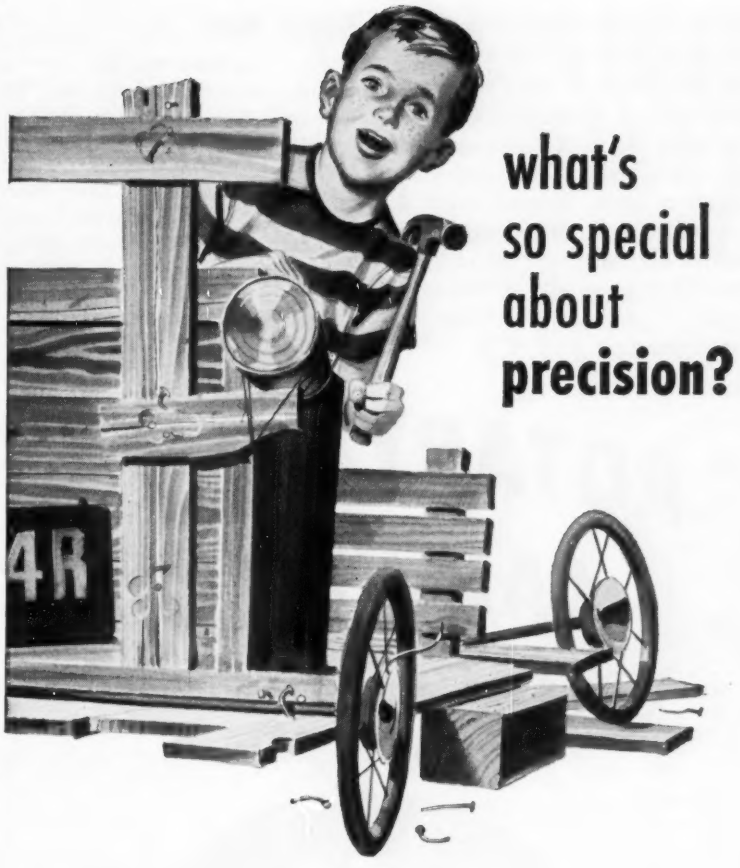
Plate Prices, Page 109

Sheared plates are moving actively. Producers that are not yet fully booked for the third quarter expect no difficulty getting all the business they desire for the period. Most producers are booked up through August, and several report September specifications are increasing.

Pressure for light plates is less than that for the heavy gage material. But interest in forward requirements is reported somewhat better in strip-plate, stimulated possibly by the likelihood of a more active demand for sheets and strip later in the summer.

Shipyard requirements will be heavier in the second half. Backlogs are growing. Bethlehem's Quincy yard booked three 46,000-ton tankers from the Hercules Transportation Co., New York, and a 1600-ton chemical carrier from the Marine Transportation Co., New York. Keels will go down early next year.

Production will be cut some over



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the next couple weeks because of vacations. For instance, this week the plate mills of the Alan Wood Steel Co. at Conshohocken, Pa., are down for mass vacations, and the 160-in. mill of the Claymont (Del.) Division, Colorado Fuel & Iron Corp., is down for repairs. It will be out practically all of July. The other plate mill at Claymont —the 120-in. unit—continues in production.

Steel Bars . . .

Bar Prices, Page 109

Some market interests say the bar mills will have more tonnage available for July shipment than they will be able to sell. Third quarter specifications have been coming out slowly, and, as a general thing, the mills do not anticipate much of a pickup in ordering until late August, when the vacation season will be about over.

Only a mild improvement in demand is expected in August. A sharp gain in specifications is seen during September, continuing active through the remainder of the year. The producers are increasingly optimistic as to fourth quarter busniess. Requirements of the automotive and related industries are expected to stimulate demand noticeably by that time. Further, consumers' inventories, it is thought, will need rebuilding.

As a general thing, cold-drawn carbon and alloy bars of all types will be under little demand pressure for the next three months, it is said. Volume will slump to a low point this month.

With the opening of a new cold-finishing mill at Willimantic. Conn., by Jones & Laughlin Steel Corp., Pittsburgh, there are now six converting units in New England. The trend is toward production of carbon specialties and alloys.

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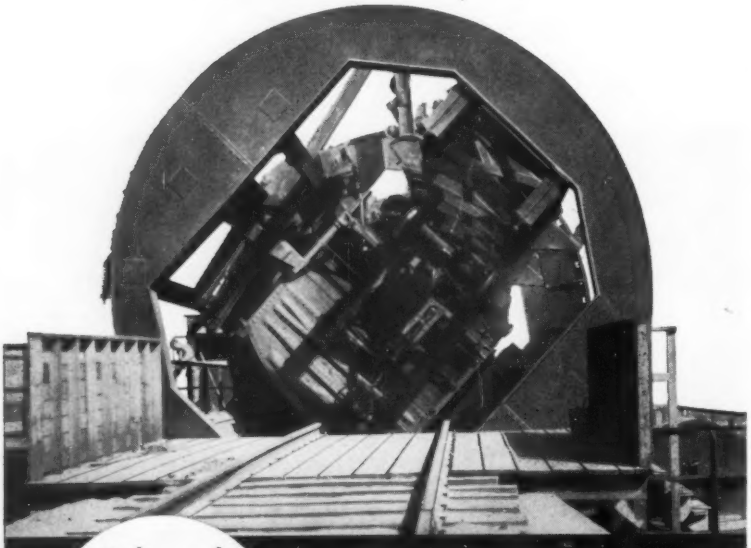
(No movable platen)



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RAILROAD CAR SHAKERS

■ Write for Bulletin 200

EASTERN CONSTRUCTORS, INC.

Poland, Ohio

Wire . . .

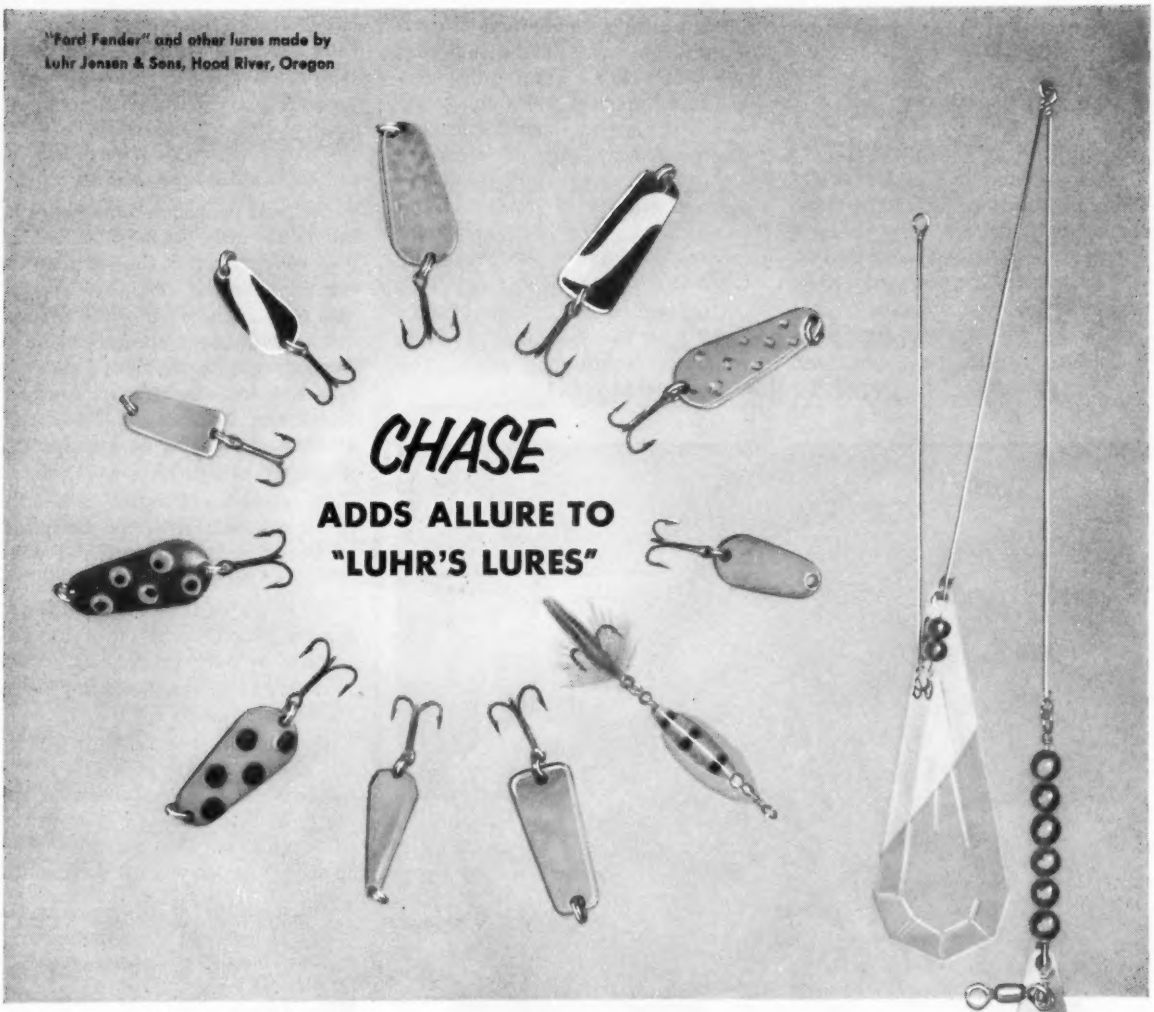
Wire Prices, Pages 111 & 112

Third quarter buying of wire products is expected to improve materially in August and September. By that time, it is believed, consumers' inventories will be pretty well depleted.

This is particularly true in the New England area, where (except for a few outstanding exceptions in heading, spring and manufacturers wire) consumers' stocks are subnormal and finished wire will be required in larger volume to meet any substantial increase in demand for end products. In the case of automotive suppliers, releases from them already are coming through for late July shipment.

A Cleveland district producer feels that sales of manufacturers wire have hit bottom and are slowly bouncing back. Demand for merchant products, however, continues to drag.

Production will likely hit the low point for the year this month. However, one week to ten days will be required to attain full scheduling after vacations, so that the rise in operations will be rather slow for a time. Some market observers think basic steel production may not immediately reflect



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CHASE DRY-ROLLED BRASS STRIP yields a higher polish at lower cost—that's what Luhr Jensen, Jr., maker of Luhr's famous fishing lures, found out.

"The final polish is far superior to anything we have been able to produce in the past," writes Mr. Jensen. "This gives a sparkle and fish-catching ability to our lures which is responsible for our continued increase in sales." And he adds: "The use of Chase Dry-Rolled Brass cuts our polishing costs approximately in half because the fishing lures can be polished in half the time, thus doubling our production with the same costs."

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any increase in third quarter demand for drawn products.

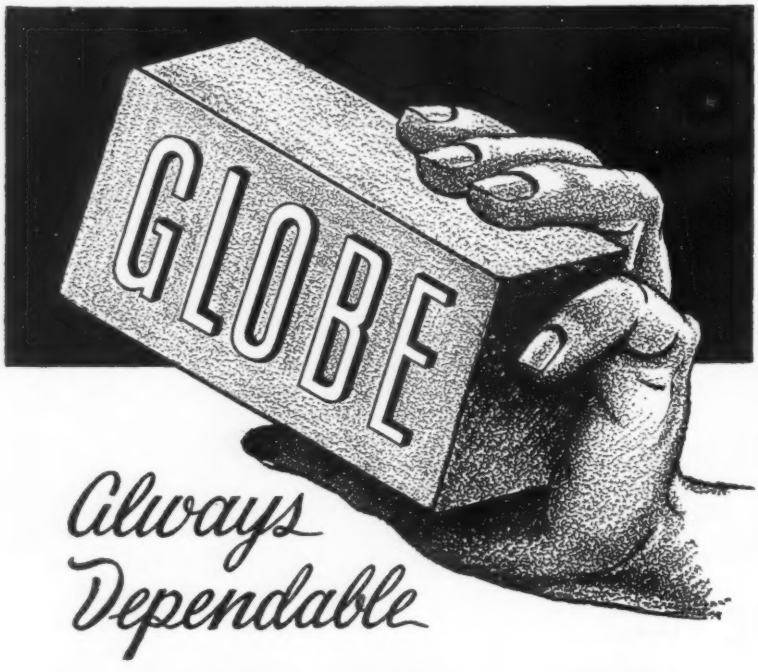
Reinforcing Bars . . .

Reinforcing Bar Prices, Page 109

Heavy production of concrete reinforcing bars makes it possible for distributors to give prompt shipments. (Among construction steel products, they are said to be the fastest.)

Demand for bridge tonnage is heavier in New England, with both delivery and price factors in contractors' procurement. Flood control and power plant inquiry also is heavier, most of the tonnage involved being on long term contracts. H-beam pile deliveries are slightly improved, but producers are sold up for a year or so on sheet piling. Highway mat reinforcement buying is not coming up to earlier expectations.

Highway work in the Pacific Northwest is absorbing a large volume of reinforcing steel. The largest bar job pending in the area calls for 1600 tons for the Washington state bridge at Bremerton.



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Warehouse . . .

Warehouse Prices, Page 114

Business booked in June was on a par with May, some distributors say. Others report the volume was smaller than in May. Whatever the final figures show, June was not up to general expectations. Unfavorable weather hampered construction in some areas. Another factor was the absence of any substantial purchasing in anticipation of higher prices.

Warehouse stocks are adequate in all products with the exception of heavy sheared plates and wide flange sections.

Many major customers of warehouses plan to shut down for vacations in July or August. This will restrict shipments during those months.

Distributors believe July will be the slowest month this year, tonnagewise as well as dollarwise, despite the likelihood of higher prices after midyear. They think the drop in specifications will be fairly sharp and will offset the increase in the dollar value of the various products.

Pig Iron . . .

Pig Iron Prices, Page 114

Merchant pig iron shipments this week are expected to be the lighest this year, barring possibly Christmas week. More foundries are down now for a week or two for mass vacations than will be the case later in the summer.

Producers look for business to be extremely dull throughout July, as the result of some buying of iron for delivery in June prior to the expected price increase, as well as to vacations and hot weather.

Pig iron production in the Buffalo district returned to 100 per cent of capacity when Bethlehem Steel Co. blew in a blast furnace that had been shut down for a relining job since May 17.

Buffalo Pipe & Foundry, one of the largest foundries in the district, reduced operations to a four-day schedule because of a drop in

orders for cast iron pipe for the home construction industry. The firm expects to return to a five-day work week soon.

Mystic Iron Works, Everett, Mass., has increased prices 50 cents a ton for third quarter delivery. Quotations are based on $67 a gross ton f.o.b. furnace, for No. 2 foundry iron. Most foundries in New England are entering the vacation period with comfortable inventories.

Blast furnace production totaled 6,945,447 net tons of pig iron and ferroalloys in May, compared with 6,870,886 tons in April, reports the American Iron & Steel Institute, New York. Of the May total, 6,879,881 tons were pig iron, bringing the total for the first five months to 34,673,160 tons. Blast furnaces operated at 94.2 per cent of capacity in May and 97.5 per cent in the first five months of the year.

Blast furnace "A" at Pittsburgh Coke & Chemical Co.'s Neville Island (Pittsburgh) plant has been blown out for relining, modernization and the addition of gas cleaning equipment. The stack will be out of blast about 50 days. It has a daily capacity of 900 tons of iron. When the specialized gas cleaning system is installed, it will be used also to produce standard ferromanganese to be sold through the company's new subsidiary, Neville Ferro Alloy Co.

Structural Shapes . . .

Structural Shape Prices, Page 109

Pressure for structural steel tonnage is easing. Even bridgework, the outstanding requirement of late, is beginning to slow up a little.

Most fabricators are busy, with the medium and large shops booked into next year. Some small shops are hungry for work, but, in general, most backlogs are fairly comfortable.

The larger bridge contracts, requiring much shopwork, extend a year or more on deliveries. Completion of contracts on some bridge work is dependent on fabricated steel delivery. If steel is on site by Aug. 1, 1958, Maine asks that bridges at Bangor, involving 415 tons, be completed by Nov. 1. In

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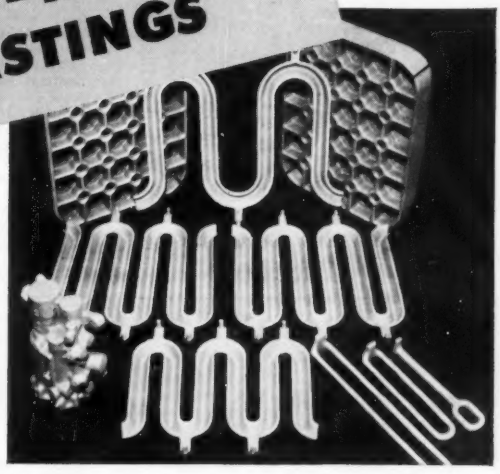
Duraloy High Alloy Casting Service...

SHELL-MOLDED CASTINGS



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Shell-molded castings provide several values over conventional castings:

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Shell-molding is ideal for mass or repetitive production of parts particularly those with intricate design.

With our conventional static and centrifugal casting service now broadened by our shell-molded casting service, we are in a better position than ever to serve industry in connection with its high alloy casting requirements. May we quote on your casting requirements that call for shell-molding?

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case the fabricated steel is not delivered by Aug. 1, 70 additional working days are specified.

New work being estimated reflects higher plain material and labor costs to the fabricators.

While demand for wide flange sections continues strong, the mills expect to cut into their backlogs this month. Standard and light structurals are reported in ample supply, meeting requirements for schools and most industrial building.

In New England, easier supply is attributed to tonnage offerings of mills that have resumed active marketing of light sections after not doing so for several years. More tonnage now is available from Pittsburgh and Buffalo, it is reported.

Iron Ore . . .

Iron Ore Prices, Page 115

Shipments of Lake Superior iron ore totaled 3,176,293 gross tons in the week ended June 24, reports the American Iron Ore Association. The figure is up sharply from the 2,984,398 tons moved in the corresponding week of 1956.

Cumulative shipments to June 24 this year amounted to 27,303,-904 tons, down 1,048,904 from the 28,351,925 tons shipped in the like period of the 1956 season.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

9000 tons, estimated, double deck vertical lift bridge, including machinery, over Copper Range railroad and Duluth, South Shore & Atlantic railroad, Portage Lake, Houghton county, Mich., to American Bridge Division, U.S. Steel Corp., Pittsburgh.

3295 tons, four state bridges, Northwestern Way extension, Oakland county, Mich., to R. C. Mahon Co., Detroit.

2800 tons, state bridge work, Mifflin county, Pennsylvania, through Hemp Bros., general contractor, to the Phoenix Bridge Co., Phoenixville, Pa., on a delivered basis; this award was recently reported as going to another fabricator.

2140 tons, 22-story office building, Lexington avenue and E. 40th street, through Emery Roth & Sons, to unnamed fabricator.

1490 tons, four buildings, Port Newark, N.J., for Port of New York Authority, to Simon Holland & Son Inc., Brooklyn, N.Y.

1386 tons, state bridge work, FISH-57-12, Jefferson county, New York, through A. J. Orlando Contracting Co. and Edenwald Contracting Co., joint contractors, to Bethlehem Steel Co., Bethlehem, Pa.

1200 tons, garage, *Daily News*, New York, to Schacht Steel Construction Inc., New York.

1200 tons, guided missile destroyer, to Todd Shipyards Corp., Seattle.

1180 tons, state bridge work, Camden and Gloucester counties, New Jersey, through Thomas Nichol Co., general contractor, to Ingalls Iron Works, Birmingham.

1145 tons, office building, Hod Carriers & Laborers Association, Washington, D.C., through Eipel Engineers, New York, to Grand Iron Works, New York.

925 tons, Loeb Student Center, New York University, Washington Square section, New York, to Lafayette Iron Works, New York.

790 tons, bridge, First street, John C. Lodge expressway, Wayne county, Mich., to the Fort Pitt Bridge Works, Pittsburgh.

705 tons, two steel barges for deck cargoes, to Todd Shipyards Corp., Seattle.

720 tons, two hopper barges for bulk cement, to Todd Shipyards Corp., Seattle.

700 tons, 12 draft tube gates, Rocky Reach power project, Wenatchee, Wash., to Consolidated Western Steel Corp., Seattle, at $404,682.

700 tons, 12-story building, 80th street and Second avenue, New York, to Schacht Steel Construction Inc., New York.

555 tons, shed, pier No. 2, Brooklyn, N.Y., for Port of New York Authority, to White Plains Iron Works, Peekskill, N.Y.

470 tons, single span plate girder bridge, Norwich, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; N. Benvenuti & Sons, New London, Conn., general contractor.

405 tons, bridge work, FAHHE-57-1 expressway, Queens county, New York, through Slattery Contracting Co., to White Plains Iron Works, Peekskill, N.Y.

427 tons, two floating pile drivers, to Todd Shipyards Corp., Seattle.

310 tons, high school, Elizabethville, Pa., to the Dauphin Steel Engineering Co., Harrisburg, Pa.

STRUCTURAL STEEL PENDING

4000 tons, state bridge, Chestnut street, Philadelphia, to McCloskey & Co., that city, general contractor.

2515 tons, steel piling, including 558 tons, special and wide flange beams, Corps of Engineers, Chicago.

2000 tons, state bridge work, York county, Pennsylvania, Kim Co., Harrisburg, Pa., low on general contract.

2000 tons or more, completion of Rocky Reach dam, Columbia river, Wenatchee, Wash.; rebids called July 23; all original bids (low, $58,561,522) having been in excess of engineers' estimates of $55,250,000; Chelan county P.U.D. No. 1, Wenatchee, Wash., principals.

415 tons, overpass and ramps, industrial spur, Interstate System, Bangor, Me.; bids in to Augusta, Me.; also 165 tons, reinforcing steel.

330 tons, Carlton bridge widening and west approach, Bath-Woolwich, Me.; Seaboard Engineering Co. Inc., Portland, Me., general contractor, $1,298,742; also 10,500 linear feet, steel H-beam piles.

305 tons, state bridge work, Lehigh county, Pennsylvania, bids July 12; also 75 tons of reinforcing steel.

300 tons, National Guard hanger, Anchorage, Alaska; also 100 tons plus, plates for a storage tank; Pacific Alaska Contractors, Anchorage, low at $910,668 to the U.S. Engineer.

150 tons, also 40 tons of reinforcing; King county Skykomish river bridge; bids to county commissioners, Seattle, July 8.

REINFORCING BARS . . .

REINFORCING BARS PLACED

485 tons, toll office building, Southern Bell Telephone Co., Columbia, S.C., to Owen Steel Co., Columbia; Daniel Construction Co., Greenville, S.C., is general contractor.

280 tons, including 125 tons mat reinforcement, highway structures and pavement, Winchester, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; White Oak Excavators Inc., Plainville, Conn., general contractor.

REINFORCING BARS PENDING

1600 tons, Washington Narrows bridge, Bremerton, Wash.; Peter Kiewit Sons Co., Seattle, general award, low $2,324,834, to State Toll Bridge Authority, Olympia, Wash.

150 tons, also miscellaneous steel, Howard Prairie canal and dam, Rogue river project, Oregon; general contract to Cherf Bros. & Sandkay Inc., Ephrata, Wash., and S. Birch & Sons, Seattle, joint low at $1,636,739 to Bureau of Reclamation, Medford, Oreg.

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$7.13	$7.36	$7.02	$6.76
Merchant Bars (¼" Round incl. all extras)	7.67	7.90	7.53	7.27
Bands (1"x⅛"x20' incl. all extras)	7.81	8.03	7.70	7.43
Angles (2"x2"x¼" incl. all extras)	6.77	7.00	7.21	6.93
Beams & Channels (base)	7.17	7.41	7.67	7.45
Furring Channels (C.R. ⅞", per 1000')	26.62	27.77	32.77	31.80
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larrven Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')	8.64	9.11	...	...
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	...	...
Tubing (2⅜", 6.4 J55, EUE, per 100')	103.00	104.00	...	...
Forged R. Turn. Bars, C-1035 (from 10" dl.)	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, coated and specialty strip, welded wire reinforcing mesh and hardware cloth, boiler tubes, API line pipe, A-335-P11 pressure pipe.

from prominent century-old West German Mills

Through Stahlunion-Export GmbH

BOCHUMER VEREIN World's first Steel Foundry, 1844—Vacuum degassed Forgings. Large Castings—all Alloys. File Steel, Rails.

DORTMUNDER UNION Originators of Interlock Sheet Piling—Larssen Sheet Piling, Plate, Shapes, Forged Bars and Shafts.

NIEDERRHEIN Europe's most modern Rod Mill—OH, CH, Low Metalloid, Specialty Wire Rod, Merchant Bars.

WESTFAELISCHE UNION Europe's largest Wire Mill—All types drawn Wire and Wire Products—Nails, Barbwire, Wire Rope, Prestress Concrete Wire.

PHOENIX RHEINROHR Europe's largest Pipe Mill—Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

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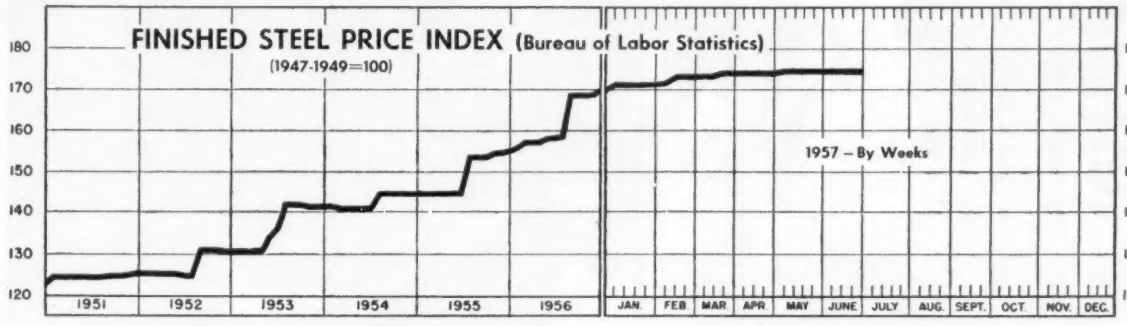
KURT ORBAN COMPANY, INC., 46 Exchange Place, Jersey City 2, N. J.

In Canada: Kurt Orban Canada, Ltd., Vancouver, Toronto, Montreal

Price Indexes and Composites



June 25, 1957	Week Ago	Month Ago	June Avg.	Year Ago
174.3	174.3	174.4	174.4	158.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 25

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.350	Bars, Reinforcing	5.788
Rails, Light, 40 lb	6.817	Bars, C.F., Carbon	9.910
Tie Plates	6.275	Bars, C.F., Alloy	13.425
Axles, Railway	9.400	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.942
Plates, Carbon	5.900	Sheets, C.R., Carbon	6.789
Structural Shapes	5.667	Sheets, Galvanized	7.990
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.475
Bars, H.R., Alloy	10.150	Strip, H.R., Carbon	5.995
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.894
Bars, H.R., Carbon	6.075	Pipe, Galv., Buttweld (100 ft)	22.344
		Pipe, Line (100 ft)	190.108
		Casing, Oil Well, Carbon (100 ft)	185.565
		Casing, Oil Well, Alloy (100 ft)	290.203
		Tubes, Boiler (100 ft)	46.737
		Tubing, Mechanical, Carbon (100 ft)	23.713
		Tubing, Mechanical, Stainless, 304 (100 ft)	197.663
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	9.775
		Wire, Drawn, Stainless, 430 (lb)	0.630
		Bale Ties (bundle)	7.423
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.327
		Woven Wire Fence (20-rod roll)	20.560

STEEL's FINISHED STEEL PRICE INDEX*

	June 26 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	228.59	228.59	228.59	210.45	171.92
Index in cents per lb	6.193	6.193	6.193	5.701	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$140.24	$140.24	$140.24	$128.98	$108.32
No. 2 Fdry Pig Iron, GT	64.70	64.70	64.70	60.27	52.54
Basic Pig Iron, GT	64.23	64.23	64.23	59.80	52.16
Malleable Pig Iron, GT	65.77	65.77	65.77	61.27	53.27
Steelmaking Scrap, GT	55.83	55.67	47.00	46.00	41.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 26 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.365	5.365	5.365	4.93	4.252
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	6.25*	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.31	5.00	3.93
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.49	8.49	8.49	7.60	5.90-6.20
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.70

*Including 0.35c for special quality.

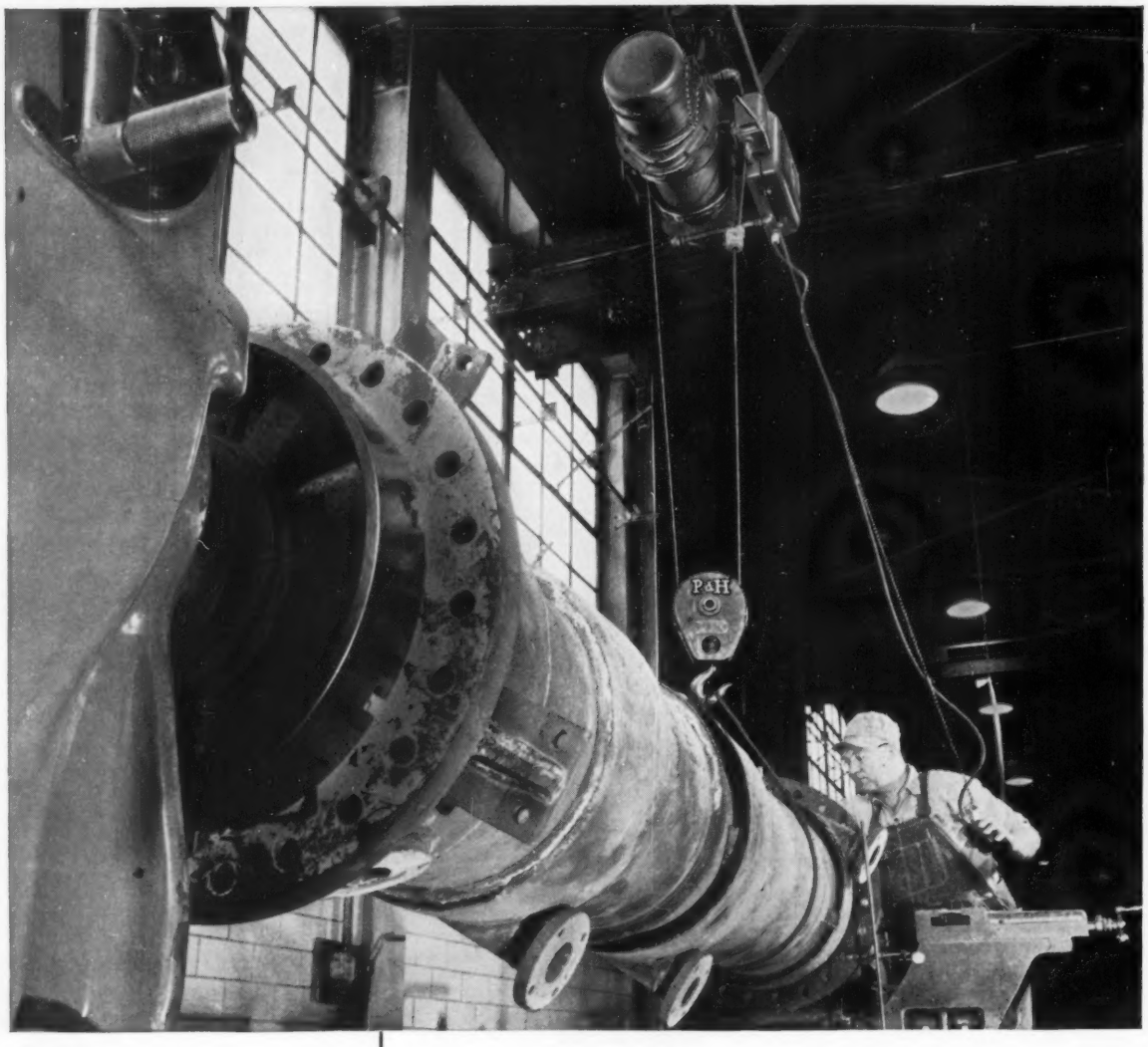
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, ½-⅝" Pitts.	5.80	5.80	5.80	5.375	4.10-4.30

PIG IRON, Gross Ton	June 26 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$65.50	$65.50	$65.50	$61.00	$53.00
Basic, Valley	64.50	64.50	64.50	60.00	52.00
Basic, deld., Phila.	68.38	68.38	68.38	63.76	56.75
No. 2 Fdry, NevilleIsland, Pa.	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, Chicago	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, deld., Phila.	68.88	68.88	68.88	64.26	57.25
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	56.43
Malleable, Valley	65.00	65.00	65.00	60.50	52.50
Malleable, Chicago	65.00	65.00	65.00	60.50	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$57.50	$56.50	$46.50	$44.50	$44.00
No. 1 Heavy Melt, E. Pa.	56.50	56.50	52.00	47.50	38.00
No. 1 Heavy Melt, Chicago	53.50	54.00	42.50	46.00	42.50
No. 1 Heavy Melt, Valley	54.50	54.50	48.50	44.50	44.00
No. 1 Heavy Melt, Cleve.	51.50	51.50	45.50	42.50	43.00
No. 1 Heavy Melt, Buffalo	46.50	46.50	40.50	42.50	37.00
Rails, Rerolling, Chicago	74.50	74.50	61.50	66.50	52.50
No. 1 Cast, Chicago	47.50	48.50	42.50	45.50	45.00

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connisvl.	18.00	18.00	18.00	16.50	17.50



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Only P&H HEVI-LIFT HOIST has maintenance-free RCD brake

P&H Hevi-Lift hoists are equipped with the RCD brake — the best brake that has ever been put on an electric hoist. It's a tough "mill-type" brake just like those used on big overhead cranes. It is virtually maintenance free — and eliminates 40% of the total hoist maintenance as a result.

The reason is simple: total brake movement is only 1/32 of an inch. In a P&H RCD brake there's no brake linkage, no laminations, and only *one* simple point of adjustment.

Moreover, the RCD brake (rectified direct current) moves *quicker* for precise inching and accurate spotting. Hevi-Lift ratings range from 1000 to 40,000 lbs. capacity.

Write for "Hevi-Lift Bulletin H-5" to Dept. 210E, Harnischfeger Corp., Milwaukee 46, Wisconsin. And for expert job analysis and engineering assistance on hoist installations contact your local P&H hoist distributor.

HARNISCHFEGER

P&H INDUSTRIAL DIVISION
MILWAUKEE 46, WIS.

Steel Prices

Mill prices as reported to STEEL, June 26, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 110; to footnotes, page 112.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)

Detroit S41 .....$74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 ....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ....74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 ....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14..91.50
S.Duquesne,Pa. U5 ...91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ...$107.00
Bridgeport,Conn. N19..107.00
Buffalo R2 .....107.00
Canton,O. R2, T7 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit S41 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ...107.00
Johnstown,Pa. B2 ....107.00
Lackawanna,N.Y. B2 ..107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 ..107.00
S.Duquesne,Pa. U5 ...107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2, W14..111.50
S.Duquesne,Pa. U5 ...111.50

SKELP

Aliquippa,Pa. J5 .....4.725
LoneStar,Tex. L6 .....5.025
Munhall,Pa. U5 .....4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ...4.625

WIRE RODS

AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
IndianaHarbor,Ind. Y1 ..5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P17 .....5.80
N.Tonawanda,N.Y. B11..5.80
Pittsburg,Calif. C11 ...6.60
Portsmouth,O. P12 ....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....5.00
Atlanta A11 .....5.20
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.00
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 ....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
Joliet,Ill. P22 .....5.00
KansasCity,Mo. S5 ....5.10
Lackawanna,N.Y. B2 ..5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.65
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.75
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14..5.00
S.SanFrancisco B3 .....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 .....5.00

Wide Flange

Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.90
IndianaHarbor,Ind. I-2..5.25
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2, Y1..7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 ....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 .....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.40
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky.(15) A10 ..4.85
Bessemer,Ala. T2 .....4.85
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ..5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 .....5.05
Harrisburg,Pa. P4 .....5.80
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1.4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14..4.85
SparrowsPoint,Md. B2 ..4.85
Sterling,Ill. N15 .....4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Youngstown R2, U5, Y1.4.85

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .....6.20
Fontana,Calif. K1 .....7.00
Geneva,Utah C11 .....6.25
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 .....11.95

PLATES, H.S., L.A.

Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1..7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy

Aliquippa,Pa. J5 .....6.85
Claymont,Del. C22 .....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ..7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 ....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Pittsburgh J5 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES

Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10..5.10
Ashland l.c.l. (15) A10..5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5....5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.275
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ..5.075
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa.(9) U5 ....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ....5.175
Emeryville,Calif. J7 ...5.825
Fairfield,Ala.(9) T2 ...5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Houston(9) S5 .....5.325
Ind.Harbor(9) I-2, Y1..5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.775
N.T'wanda,N.Y.(9)B11 5.425
Pittsburg,Calif.(9) C11..5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.825
Seattle B3, N14 .....5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5..5.075
S.SanFran.,Calif.(9)B3 5.825
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ...5.45
Torrance,Calif.(9) C11..5.775
Youngstown(9) R2, U5..5.075

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.125
Bethlehem,Pa. B2 .....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2, T7 .....6.125
Clairton,Pa. U5 .....6.125
Detroit S41 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2, Y1..6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 ....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
Pittsburgh J5 .....6.125
S.Chicago R2,U5,W14 ..6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 ....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Duquesne,Pa. U5 ....7.425
S.Chicago,Ill. U5, W14..7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.225
Houston(9) S5 .....5.325
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ...5.075
Tonawanda,N.Y. B12 ..5.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.075
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.55
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 ....6.45
Pittsburgh J5 .....6.20
Youngstown U5 .....6.20

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.35
Monaca,Pa. S17 .....9.475
Newark,N.J. W18 .....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2..6.85
Birmingham C15 .....7.45
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 .....6.85
Detroit B5, P17 .....7.05
Detroit S41 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ...6.85
Gary,Ind. R2 .....6.85
GreenBay,Wis. F7 .....6.85
Hammond,Ind. L2, M13..6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles R2 .....8.75
LosAngeles P2 .....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ...6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4...6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 .....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..6.10

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa. M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 .....8.325
Detroit B5, P17 .....8.525
Detroit S41 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 .....8.325
Hammond,Ind. L2,M13..8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles S30 .....10.10
LosAngeles P2 .....10.20
Mansfield,Mass. B5 ....8.625
Massillon,O. R2, R8 ...8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 .....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ...8.625
Youngstown F3, Y1 ...8.325

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.275
Birmingham C15 .....5.075
Bridgeport,Conn. N9 ...5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ..5.825

Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225
Fontana,Calif. K1 ....5.775
Ft.Worth,Tex.(4) T4 ..5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.775
Pittsburg,Calif. C11 ...5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.825
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago, Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint, Md. B2.5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ..5.65
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ...5.075

BARS, Reinforcing
(Fabricated; to Consumers)

Boston B2 .....7.30
Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2 6.73
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ..6.50
Marion,O. P11 .....6.70
New York U8 .....7.20
Pittsburgh J5, U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ¼-1" B2 ...6.73
Williamsport,Pa. S19 ..6 85

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.075
ChicagoHts.(4)(44) I-2 5.075
ChicagoHts.(4) C2 ....5.075
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(3) F5 ....5.10
Franklin,Pa.(4) F5 ...5.075
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.10
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 ....5.15
Tonawanda(4) B12 ....5.65
Williamsport,Pa.(3) S19.5.15

Bars, Wrought Iron

Economy,Pa.(S.R.)B14 13.15
Economy,Pa.(D.R.)B14 16.35
Economy(Staybolt)B14, 16.80
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5 19.15

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ...4.675
Cleveland J5, R2, ...4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Irvin,Pa. U5 .....4.675
Lackawanna,N.Y. B2..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ...4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ...5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Irvin,Pa. U5 .....7.75
Newport,Ky. A2 .....7.75
Youngstown U5, Y1 ....7.75

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength, Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ..6.95
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1.6.90
Irvin,Pa. U5 .....6.90
Lackawanna(35) B2 ...6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 .....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....5.425
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 ....5.95
Ind.Harbor,Ind. I-2, Y1.5.75
Irvin,Pa. U5 .....5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 ....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .... 5.75
SparrowsPoint,Md. B2 ..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 .....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled
High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 ....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Irvin,Pa. U5 .....8.525
Lackawanna(37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2.8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	6.65	7.15
Fairfield T2	6.65	6.90
Gary,Ind. U5	6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	6.65	6.90
Irvin,Pa. U5	6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	6.90
Pittsburgh J5	6.65	...
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ...6.30†
Irvin,Pa. U5 .....6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ...6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized
High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Irvin,Pa. U5 .....6.70

SHEETS, Galvanized Ingot Iron
(Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.95
Butler,Pa. A10 (type 2).9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Irvin,Pa. U5 .....6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ....8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 ....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Dawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn. Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U5 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel&Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.675
Allenport, Pa. P7	4.675
Alton, Ill. L1	4.875
Ashland, Ky. (8) A10	4.675
Atlanta A11	4.875
Bessemer, Ala. T2	4.675
Birmingham C15	4.675
Buffalo (27) R2	4.675
Conshohocken, Pa. A3	4.725
Detroit M1	4.775
Ecorse, Mich. G5	4.775
Fairfield, Ala. T2	4.675
Fontana, Calif. K1	5.525
Gary, Ind. U5	4.675
Houston S5	4.925
Ind. Harbor, Ind. I-2, Y1	4.675
Johnstown, Pa. (25) B2	4.675
Kansas City, Mo. S5	4.925
Lackaw'na, N.Y. (25) B2	4.675
Los Angeles (25) B3	5.425
Minnequa, Colo. C10	5.775
Pittsburg, Calif. C11	5.425
Riverdale, Ill. A1	4.675
San Francisco S7	5.95
Seattle (25) B3	5.675
Seattle N14	5.675
Sharon, Pa. S3	4.675
S. Chicago, Ill. W14	4.675
S. San Francisco (25) B3	5.425
Sparrows Point, Md. B2	4.675
Sterling, Ill. (1) N15	4.675
Sterling, Ill. N15	4.775
Torrance, Calif. C11	5.425
Warren, O. R2	4.675
Weirton, W. Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Carnegie, Pa. S18	7.75
Gary, Ind. U5	7.75
Ind. Harbor, Ind. Y1	7.75
Los Angeles B3	8.95
Newport, Ky. A2	7.75
Sharon, Pa. S3	7.75
S. Chicago, Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer, Ala. T2	6.95
Conshohocken, Pa. A3	6.95
Ecorse, Mich. G5	7.05
Fairfield, Ala. T2	6.95
Gary, Ind. U5	6.95
Houston S5	7.20
Ind. Harbor, Ind. I-2, Y1	6.95
Kansas City, Mo. S5	7.20
Lackawanna, N.Y. B2	6.95
Los Angeles (25) B3	7.70
Seattle (25) B3	7.95
Sharon, Pa. S3	6.95
S. San Francisco (25) B3	7.70
Sparrows Point, Md. B2	6.95
Warren, O. R2	6.95
Weirton, W. Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.925
Warren, O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken, Pa. A3	6.90
Dearborn, Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover, O. G6	6.85
Ecorse, Mich. G5	6.95
Evanston, Ill. M22	6.95
Follansbee, W. Va. F4	6.85
Fontana, Calif. K1	8.70
Franklin Park, Ill. T6	6.95
Ind. Harbor, Ind. Y1	6.85
Indianapolis C8	7.00
Los Angeles C1	8.90
New Bedford, Mass. R10	7.30
New Britain (10) S15	6.85
New Castle, Pa. B4, E5	6.85
New Haven, Conn. D2	7.30
New Kensington, Pa. A6	6.85
Pawtucket, R.I. R3	7.50
Pawtucket, R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale, Ill. A1	6.95
Rome, N.Y. (32) R6	6.85
Sharon, Pa. S3	6.85
Trenton, N.J. (31) R5	8.30
Wallingford, Conn. W2	7.30
Warren, O. R2, T5	6.85
Weirton, W. Va. W6	6.85
Worcester, Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie, Pa. S18	14.55
Cleveland A7	14.55
Dover, O. G6	14.55
Franklin Park, Ill. T6	14.55
Harrison, N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket, R.I. N8	14.90
Sharon, Pa. S3	14.55
Worcester, Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn, Mich. D3	10.10
Dover, O. G6	10.10
Ecorse, Mich. G5	10.10
Ind. Harbor, Ind. Y1	10.20
Sharon, Pa. S3	10.00
Warren, O. R2	10.00
Weirton, W. Va. W6	10.00
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.20	10.40	12.60	15.60	18.55
Boston T6	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. W1	....	10.40	12.60	15.60	18.55
Carnegie, Pa. S18	8.65	10.10	12.30	15.30	....
Cleveland A7	8.65	10.10	12.30	15.30	18.25
Cleveland C7	....	10.10	12.30	15.30	18.25
Dearborn, Mich. D3	8.75	10.20	12.40	....	....
Detroit D2	8.75	10.20	12.40	15.40	....
Dover, O. G6	8.65	10.10	12.30	15.30	18.25
Evanston, Ill. M22	8.65	10.10	12.30	....	....
Franklin Park, Ill. T6	8.75	10.10	12.30	15.30	18.25
Harrison, N.J. C18	....	....	12.60	15.60	18.55
Indianapolis C8	8.80	10.25	12.30	15.30	18.25
Los Angeles C1	10.85	12.30	14.50	....	....
New Britain, Conn. (10) S15	8.65	10.10	12.30	15.30	18.25
New Castle, Pa. B4, E5	8.65	10.10	12.30	15.30	....
New Haven, Conn. D2	9.10	10.40	12.60	15.60	....
New Kensington, Pa. A6	8.65	10.10	12.30	15.30	....
New York W3	....	10.40	12.60	15.60	18.55
Pawtucket, R.I. N8	9.20	10.40	12.60	15.60	18.55
Riverdale, Ill. A1	8.75	10.10	12.30	15.30	18.25
Rome, N.Y. (32) R6	8.65	10.10	12.30	15.30	18.25
Sharon, Pa. S3	8.65	10.10	12.30	15.30	18.25
Trenton, N.J. R5	....	10.40	12.60	15.60	18.55
Wallingford, Conn. W2	9.10	10.40	12.60	15.60	18.45
Warren, O. T5	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. A7, T6	9.20	10.40	12.60	15.60	18.55
Youngstown C8	8.65	10.10	12.30	15.30	18.25

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.975

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover, O. G6	6.85*
Evanston, Ill. M22	6.95
Riverdale, Ill. A1	6.95*
Warren, O. B9, T5	6.85*
Worcester, Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.49
Riverdale, Ill. A1	5.25
Sharon, Pa. S3	5.10
Youngstown U5	5.10

STRIP, Cold-Finished Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	17.10	20.95	25.30
Buffalo W12	17.10	....	....
Franklin Park, Ill. T6	17.45	21.30	25.65
Harrison, N.J. C18	17.10	20.95	25.30
New York W3	17.10	20.95	25.30
Palmer, Mass. W12	17.10	....	....
Trenton, N.J. R5	17.10	20.95	25.30
Worcester, Mass. A7, T6	17.10	20.95	25.30
Youngstown C8	17.45	21.30	25.65

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom, W.Va. W10	....	....	11.00	12.05	13.05
Brackenridge, Pa. A4	....	....	11.00	12.05	13.05
Mansfield, O. E6	9.20	10.35	11.00	12.05	13.05
Newport, Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles, O. M21	9.20	10.35	11.00	12.05	....
Vandergrift, Pa. U5	....	10.35	11.00	12.05	13.05
Warren, O. R2	9.20	10.35	11.00	12.05	....
Zanesville, O. A10	....	10.35	11.00	12.05	13.05
Zanesville, O. A10 (FP coils)	....	10.85	11.525	12.575	13.55
Zanesville, O. A10 (SP coils)	....	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge, Pa. A4	....	....	11.525	12.575	13.55
Granite City, Ill. G4	9.40*	10.55*	11.225*	12.275*	....
Indiana Harbor, Ind. I-2	9.20†	10.35*	11.025*	12.075*	....
Mansfield, O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift, Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift, Pa. U5	....	....	10.85†	11.525†	12.575† 13.55†
Warren, O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
Beech Bottom, W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge, Pa. A4	14.05	....	....	....
Vandergrift, Pa. U5	14.05	14.60	15.10	16.15
Zanesville, O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge, Pa. A4	....	16.90	18.50	19.00	19.50	....
Butler, Pa. A10	....	....	....	18.50	19.00	19.50	....
Vandergrift, Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren, O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$8.75	$9.00	$9.40
Fairfield, Ala. T2	8.85	9.10	9.50
Fairless, Pa. U5	8.85	9.10	9.50
Fontana, Calif. K1	9.50	9.75	10.15
Gary, Ind. U5	8.75	9.00	9.40
Granite City, Ill. G4	8.85	9.10	9.50
Indiana Harbor, Ind. I-2, Y1	8.75	9.00	9.40
Irvin, Pa. U5	8.75	9.00	9.40
Niles, O. R2	8.75	9.00	9.40
Pittsburg, Calif. C11	9.50	9.75	10.15
Sparrows Point, Md. B2	8.85	9.10	9.50
Weirton, W. Va. W6	8.75	9.00	9.40
Yorkville, O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa, Pa. J5	7.425	7.625	....
Niles, O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa, Pa. J5	$10.05	$10.30
Fairfield, Ala. T2	10.15	10.40
Fairless, Pa. U5	10.15	10.40
Fontana, Calif. K1	10.80	11.05
Gary, Ind. U5	10.05	10.30
Irvin, Pa. U5	10.05	10.30
Pitts., Calif. C11	10.80	11.05
Sp. Pt., Md. B2	10.15	10.40
Weirton, W. Va. W6	10.05	10.30
Yorkville, O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$7.85
Fairfield, Ala. T2	7.95
Fairless, Pa. U5	7.95
Fontana, Calif. K1	8.60
Gary, Ind. U5	7.85
Granite City, Ill. G4	7.95
Ind. Harbor, Ind. I-2, Y1	7.85
Irvin, Pa. U5	7.85
Niles, O. R2	7.85
Pittsburg, Calif. C11	8.60
Sparrows Point, Md. B2	7.95
Weirton, W. Va. W6	7.85
Yorkville, O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	$7.50
Gary, Ind. U5	7.50
Granite City, Ill. G4	7.60
Ind. Harbor, Ind. Y1	7.50
Irvin, Pa. U5	7.50
Yorkville, O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary, Ind. U5	$9.70
Irvin, Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary, Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. R2	7.20
Aliquippa, Pa. J5	7.20
Alton, Ill. L1	7.40
Atlanta A11	7.40
Bartonville, Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville, Ind. M8	7.30
Donora, Pa. A7	7.20
Duluth A7	7.20
Fairfield, Ala. T2	7.20
Fostoria, O. (24) S1	7.30
Houston S5	7.45
Jacksonville, Fla. M8	7.55
Johnstown, Pa. B2	7.20
Joliet, Ill. A7	7.20
Kansas City, Mo. S5	7.45
Kokomo, Ind. C16	7.30
Los Angeles B3	8.15
Minnequa, Colo. C10	7.45
Monessen, Pa. P7, P16	7.20
N. Tonawanda, N.Y. B11	7.20
Palmer, Mass. W12	7.50
Pittsburg, Calif. C11	8.15
Portsmouth, O. P12	7.20
Rankin, Pa. A7	7.20
S. Chicago, Ill. R2	7.20
S. San Francisco C10	8.15
Sparrows Point, Md. B2	7.30
Sterling, Ill. (1) N15	7.20
Sterling, Ill. N15	7.30
Struthers, O. Y1	7.20
Waukegan, Ill. A7	7.20
Worcester, Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville, Ill. K4	11.90
Buffalo W12	11.90
Cleveland A7	11.90
Donora, Pa. A7	11.90
Duluth A7	11.90
Johnstown, Pa. B2	11.90
Minnequa, Colo. C10	12.025
Monessen, Pa. P16	11.90
Muncie, Ind. I-7	12.10
New Haven, Conn. A7	12.20
Palmer, Mass. W12	12.20
Pittsburg, Calif. C11	12.70
Portsmouth, O. P12	11.90
Roebling, N.J. R5	12.20
Sparrows Pt., Md. B2	12.00
Struthers, O. Y1	11.90
Trenton, N.J. A7	12.20
Waukegan, Ill. A7	11.90
Worcester, Mass. A7	12.20

WIRE, Upholstery Spring

Aliquippa, Pa. J5	8.70
Alton, Ill. L1	8.90
Buffalo W12	8.70
Cleveland A7	8.70
Donora, Pa. A7	8.70
Duluth A7	8.70
Johnstown, Pa. B2	8.70
Kansas City, Mo. S5	8.95
Minnequa, Colo. C10	8.90
Los Angeles B3	9.65
Monessen, Pa. P7, P16	8.70
New Haven, Conn. A7	9.00
Palmer, Mass. W12	9.00
Pittsburg, Calif. C11	9.65
Portsmouth, O. P12	8.70
Roebling, N.J. R5	9.00
S. Chicago, Ill. R2	8.70
S. San Francisco C10	9.65
Sparrows Pt., Md. B2	8.80
Struthers, O. Y1	8.70
Trenton, N.J. A7	9.00
Waukegan, Ill. A7	8.70
Worcester, Mass. A7	9.00

WIRE, MB Spring, High Carbon

Aliquippa, Pa. J5	9.025
Alton, Ill. L1	9.225
Bartonville, Ill. K4	9.125
Buffalo W12	9.025
Cleveland A7	9.025
Donora, Pa. A7	9.025
Duluth A7	9.025
Fostoria, O. S1	9.075
Johnstown, Pa. B2	9.025
Los Angeles B3	9.975
Milbury, Mass. (12) N6	9.325
Minnequa, Colo. C10	9.275
Monessen, Pa. P7, P16	9.025
Muncie, Ind. I-7	9.225
Palmer, Mass. W12	9.325
Pittsburg, Calif. C11	9.975
Portsmouth, O. P12	9.025
Roebling, N.J. R5	9.325
S. Chicago, Ill. R2	9.025
S. San Francisco C10	9.975
Sparrows Pt., Md. B2	9.125
Struthers, O. Y1	9.025
Trenton, N.J. A7	9.325
Waukegan, Ill. A7	9.025
Worcester J4, T6, W12	9.325
Worcester, Mass. A7	9.325

WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	14.65
Bartonville, Ill. K4	14.55
Buffalo W12	14.45
Chicago W13	14.45
Cleveland A7	14.45
Crawfordsville, Ind. M8	14.25
Fostoria, O. S1	14.45
Jacksonville, Fla. M8	14.50
Johnstown, Pa. B2	14.45
Kokomo, Ind. C16	14.45
Monessen, Pa. P7	14.45
Muncie, Ind. I-7	14.65
Palmer, Mass. W12	14.75
Roebling, N.J. C10	14.45
S. San Francisco C10	14.80
Waukegan, Ill. A7	14.45
Worcester, Mass. A7, T6	14.75

ROPE WIRE

Bartonville, Ill. K4	12.00
Buffalo W12	12.00
Fostoria, O. S1	12.00
Johnstown, Pa. B2	12.00
Monessen, Pa. P7	12.00
Muncie, Ind. I-7	12.20
Palmer, Mass. W12	12.30
Portsmouth, O. P12	12.00
Roebling, N.J. R5	12.30
Sparrows Pt., Md. B2	12.10
Struthers, O. Y1	12.00
Worcester, Mass. J4	12.30

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.75
Monessen,Pa. P16	15.45
Roebling,N.J. R5	16.10

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Chicago W13	10.85
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	11.05
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewLensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES,

Stock	Col.
AlabamaCity,Ala. R2	164
Aliquippa,Pa. J5	164
Atlanta A11	166
Bartonville,Ill. K4	166
Crawfordsville,Ind. M8	166
Donora,Pa. A7	164
Duluth A7	164
Fairfield,Ala. T2	164
Houston,Tex. S5	169
Jacksonville,Fla.(20) M8	175
Johnstown,Pa. B2	164
Joliet,Ill. A7	164
KansasCity,Mo. S5	169
Kokomo,Ind. C16	166
Minnequa,Colo. C10	169
Monessen,Pa. P7	164
Pittsburg,Calif. C11	183
Rankin,Pa. A7	164
S.Chicago,Ill. R2	164
SparrowsPt.,Md. B2	166
Sterling,Ill.(7) N15	166
Worcester,Mass. A7	170

NAILS, Stock

	Col.
Chicago W13	164
Cleveland A9	170

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.82
Atlanta A11	9.63
Bartonville,Ill. K4	9.63
Buffalo W12	9.82
Chicago W13	9.82
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.82
Duluth A7	9.82
Fairfield,Ala. T2	9.82
Houston S5	10.07
Jacksonville,Fla. M8	10.09
Johnstown,Pa. B2	9.82
Joliet,Ill. A7	9.82
KansasCity,Mo. S5	10.07
Kokomo,Ind. C16	9.92
LosAngeles B3	10.61
Minnequa,Colo. C10	10.07
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.82
S.SanFrancisco C10	10.60
SparrowsPt.,Md. B2	9.92
Sterling,Ill.(37) N15	9.82
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$10.15
Atlanta A11	9.95
Bartonville,Ill. K4	9.95
Buffalo W12	10.15
Chicago W13	10.15
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	10.15
Duluth A7	10.15
Fairfield,Ala. T2	10.15
Houston S5	10.40
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	10.15
Joliet,Ill. A7	10.15
KansasCity,Mo. S5	10.40
Kokomo,Ind. C16	10.25
LosAngeles B3	10.95
Minnequa,Colo. C10	10.40
Pittsburg,Calif. C11	10.95
S.Chicago,Ill. R2	10.15
S.SanFrancisco C10	10.95
SparrowsPt.,Md. B2	10.25
Sterling,Ill.(37) N15	10.15
Coil Interim	
AlabamaCity,Ala. R2	$10.20
Atlanta A11	10.00
Bartonville,Ill. K4	10.00
Buffalo W12	10.20
Chicago W13	10.20
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	10.20
Duluth A7	10.20
Fairfield,Ala. T2	10.20
Houston S5	10.45
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	10.20
Joliet,Ill. A7	10.20
KansasCity,Mo. S5	10.45
Kokomo,Ind. C16	10.30
LosAngeles B3	11.00
Minnequa,Colo. C10	10.45
Pittsburg,Calif. C11	11.00
S.Chicago,Ill. R2	10.20
S.SanFrancisco C10	11.00
SparrowsPt.,Md. B2	10.30
Sterling,Ill.(37) N15	10.20

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	196
Atlanta A11	192
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	196
Duluth A7	196
Fairfield,Ala. T2	196
Houston S5	201
Jacksonville,Fla. M8	197
Joliet,Ill. A7	190
KansasCity,Mo. S5	201
Kokomo,Ind. C16	198
Minnequa,Colo. C10	201
Pittsburg,Calif. C11	220
S.SanFrancisco C10	220
Sterling,Ill.(7) N15	196
SparrowsPt.,Md. B2	198
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	167
Duluth A7	167
Franklin,Pa. F5	167
Huntington,W.Va. W7	169
Johnstown,Pa. B2	167
Marion,O. P11	167
Minnequa,Colo. C10	172
Sterling,Ill.(1) N15	167
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	181§
Atlanta A11	190*
Bartonville,Ill. K4	190
Crawfordsville,Ind. M8	190
Donora,Pa. A7	184†
Duluth A7	184†
Fairfield,Ala. T2	184†
Houston,Tex. S5	189**
Jacksonville,Fla. M8	195
Johnstown,Pa. B2	188*
Joliet,Ill. A7	184†
KansasCity,Mo. S5	189**
Kokomo,Ind. C16	186†
Minnequa,Colo. C10	189**
Monessen,Pa. P7	188*
Pittsburg,Calif. C11	204†
Rankin,Pa. A7	184†
S.Chicago,Ill. R2	184**
S.SanFrancisco C10	204**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(7) N15	191††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	176**
Aliq'ppa,Pa. 9-14½ga.J2	179§
Atlanta A11	182*
Bartonville,Ill. K4	182
Crawfordsville,Ind. M8	182
Donora,Pa. A7	176†
Duluth A7	176†
Fairfield,Ala. T2	176†
Houston,Tex. S5	181**
Jacksonville,Fla. M8	187
Johnstown,Pa.(43) B2	180*
Joliet,Ill. A7	176†
KansasCity,Mo. S5	181**
Kokomo,Ind. C16	178†
Minnequa,Colo. C10	181**
Monessen,Pa. 9 ga. P7	180*
Pittsburg,Calif. C11	199†
Rankin,Pa. A7	176†
S.Chicago,Ill. R2	176**
Sterling,Ill.(7) N15	181††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	16.00	17.55**
Aliq'ppa,Pa. J5	15.70	17.50
Bartonville K4	15.80	17.75
Cleveland A7	16.00	....
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	16.50	18.05†
Houston S5	16.25	17.80**
Jacksonville M8	16.05	18.00
Johnstown B2	16.00	17.95*
Kan.City,Mo. S5	16.25	....
Kokomo C16	16.10	17.65†
Minnequa C10	16.25	17.80*
P'lm'r,Mass.W12	16.30	17.85†
Pitts.,Calif. C11	16.35	17.90†
SparrowsPt. B2	16.10	18.05*
Sterling(37)N15	16.00	17.90††
Waukegan A7	16.00	17.55†
Worcester A7	16.30	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	8.20	8.75**
Aliquippa J5	7.95	8.475§
Atlanta(48) A11	8.05	8.65*
Bartonville(48) K4	8.05	8.65
Buffalo W12	8.20	8.75†
Cleveland A7	8.20	....
Crawfordsville M8	8.05	8.65
Donora,Pa. A7	8.20	8.75†
Duluth A7	8.20	8.75†
Fairfield T2	8.20	8.75†
Houston(48) S5	8.45	9.00**
Jacks'ville,Fla. M8	8.30	8.90
Johnstown B2(48)	8.20	8.95*
Joliet,Ill. A7	8.20	8.75†
Kans.City(48) S5	8.45	9.00**
Kokomo C16	8.30	8.85†
LosAngeles B3	9.15	9.90*
Minnequa C10	8.45	9.00‡
Monessen P7(48)	7.95	8.55*
Palmer,Mass. W12	8.50	9.05†
Pitts.,Calif. C11	9.15	9.70†
Rankin,Pa. A7	8.20	8.75†
S.Chicago R2	8.20	8.75**
S.SanFran. C10	9.15	9.70*
Spar'wsPt. B2(48)	8.30	9.05*
Sterling(37)(48)N15	8.35	9.10
Struth'rs,O.(48)Y1	8.20	8.85‡
Worcester,Mass.A7	8.50	9.05†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	52.5
Longer than 6 in.	43.5
⅝ in. thru 1 in.:	
6 in. and shorter	43.5
Longer than 6 in.	41.5
1⅛ in. and larger:	
All lengths	41.5

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	52.5

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	32.0
Longer than 6 in.	19.0
⅝ in. thru 1 in.:	
6 in. and shorter	16.0
Longer than 6 in.	16.0
1⅛ in. and larger:	
All lengths	16.0

Lag Bolts

All diameters:

6 in. and shorter	52.5
Longer than 6 in.	44.5

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	52.0
Larger than ½ in. or longer than 6 in.	44.5
Blank Bolts	44.5
Step, Elevator, Tire Bolts	52.0

Stove Bolts, Slotted

⅛ to ⅛-in. incl., 3 in. and shorter	54.00
⅛ to ⅛-in., inclusive	54.00

NUTS

Reg. & Heavy Square Nuts:

All sizes	58.0
Square Nuts, Reg. & Heavy, Hot Galvanized:	
All sizes	44.0
Hex Nuts, Reg. &	
Heavy, Hot Pressed:	
¾ in. and smaller	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger	56.0
Hex Nuts, Reg. & Heavy, Cold Punched:	
¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0
Hex Nuts, All Types, Hot Galvanized:	
¾ in. and smaller	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0
Hex Nuts, Semifinished, Heavy (Incl. Slotted):	
¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0
Hex Nuts, Finished (Incl. Slotted and Castellated):	
1 in. and smaller	64.00
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

Semifinished Hex Nuts, Reg. (Including Slotted):

⅝ in. and smaller	61.5
¾ in. to 1-in., incl.	54.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	44.0
¾, ⅞ and 1 in. diam.	27.0

Longer than 6 in.:

⅝ in. and smaller	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	31.0
¾, ⅞ and 1 in. diam.	9.0

Longer than 6 in.:

⅝ in. and smaller	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Capscrews:

¾ in. and smaller	+65.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 11.50

7/16-in. under List less 23%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	24.55	23.54
1¼	13	....	29.07	23.36
1½	13	27.45	32.14	25.83
1¾	13	32.43	37.97	30.51
2	13	36.34	42.58	34.20
2¼	13	40.93	47.94	38.52
2½	12	44.42	52.03	41.81
2¾	12	48.94	57.31	46.05
3	12	52.99	62.05	49.88
3	12	56.51	66.18	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.275	5.175	5.225	6.25
Ensley,Ala. T2	5.275	5.175	....	6.25
Fairfield,Ala. T2	....	....	....	6.25
Huntington,W.Va. C15	....	....	....	6.25
Gary,Ind. U5	5.275	5.175	5.225	...
IndianaHarbor,Ind. I-2	5.275	5.175	5.225	...
Johnstown,Pa. B2	....	....	...(16)	6.25
Lackawanna,N.Y. B2	5.275	5.175	....	6.25
Minnequa,Colo. C10	5.275	5.175	....	6.75
Steelton,Pa. B2	5.275	5.175	....	...
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.275
Gary,Ind. U5	6.275
Ind.Harbor,Ind. I-2	6.275
Lackawanna,N.Y. B2	6.275
Minnequa,Colo. C10	6.275
Seattle B3	6.425
Steelton,Pa. B2	6.275
Torrance,Calif. C11	6.425

JOINT BARS

Bessemer,Pa. U5	6.60
Fairfield,Ala. T2	6.60
Ind.Harbor,Ind. I-2	6.60
Joliet,Ill. U5	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Steelton,Pa. B2	6.60

AXLES

Ind.Harbor,Ind. S13	8.35
Johnstown,Pa. B2	8.35

TRACK BOLTS, Untreated

Cleveland R2	13.85
KansasCity,Mo. S5	13.85
Lebanon,Pa. B2	13.85
Minnequa,Colo. C10	13.85
Pittsburgh P14	13.10
Seattle B3	14.35

SCREW SPIKES

Lebanon,Pa. B2	13.60
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.225
Ind.Harbor,Ind. I-2, Y1	9.225
KansasCity,Mo. S5	9.225
Lebanon,Pa. B2	9.225
Minnequa,Colo. C10	9.225
Pittsburgh J5	9.225
Seattle B3	9.725
S.Chicago,Ill. R2	9.225
Struthers,O. Y1	9.225
Youngstown R2	9.225

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.25c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.35c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3⅛-in. and smaller rounds; 5.65c, over 3⅛-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25
Ambridge, Pa. N2	+5.25	....	1.25	....	3.75	....	5.25	....	5.25	....	5	....	7.5	....
Lorain, O. N3	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25
Youngstown Y1	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+5.25	+20.25	1.25	+15.5	3.75	+13	5.25	+11.5	5.25	+11.5	5	+11.75	7.5	+9.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Alton, Ill. L1	....	....	....	....	....	....	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Benwood, W. Va. W10	6.5	+20	+4.75	+28.25	+14.75	+36.25	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Butler, Pa. F6	7.5	+19	+3	+26.5	+12.5	+34	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Fairless, Pa. N3	....	....	....	....	....	....	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Fontana, Calif. K1	....	....	....	....	....	....	3.75	+19	+0.75	+15	2.75	+10.5	5.25	+9.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	8.25	+7	11.25	+3	14.75	1.5	17.25	0.75
Lorain, O. N3	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Sharon, Pa. S4	6.5	+20	+4	+27.5	+13.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Sparrows Pt., Md. B2	5.5	+21	+0.5	+28.5	+14.5	+36	7.25	+8	10.25	+4	13.75	0.5	16.25	1.25
Wheatland, Pa. W9	7.75	+19	+3	+26.5	+12.5	+34	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25
Youngstown R2, Y1	....	....	....	....	....	....	9.25	+6	12.25	+2	15.75	2.5	18.25	3.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Alton, Ill. L1	16.75	2.25	17.25	2.75	18.75	2.5	18.75	2.5	....	....	....	....
Benwood, W. Va. W10	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Etna, Pa. N2	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Fairless, Pa. N3	16.75	2.25	17.25	2.75	18.75	2.5	18.75	2.5	8.25	+8.5	8.25	+8.5
Fontana, Calif. K1	5.75	+8.75	6.25	+8.25	7.75	+8.5	7.75	+8.5	+2.75	+19.5	+2.75	+19.5
Indiana Harbor, Ind. Y1	17.75	3.25	18.25	3.75	19.75	3.5	19.25	3.5	9.25	+7.5	9.25	+7.5
Lorain, O. N3	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Sharon, Pa. M6	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	....	....	....	....
Sparrows Pt., Md. B2	16.75	2.25	17.25	3.75	18.75	2.5	18.75	2.5	8.25	+8.5	8.25	+8.5
Wheatland, Pa. W9	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5
Youngstown R2, Y1	18.75	4.25	19.25	4.75	20.75	4.5	20.75	4.5	10.25	+6.5	10.25	+6.5

*Galvanized pipe discounts based on current price of zinc (11.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	40.50	42.50	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	....	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.75	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.50	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	35.50
304	33.15	36.20	40.30	44.50	37.75
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	55.50
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	44.75
347	37.05	41.25	46.45	51.70	54.25
405	27.55	29.20	33.15	37.95	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....		4.170
18.25	4.25	1	4.75	....		2.385
18	4	2	9	....		2.755
18	4	2	....	....		1.845
18	4	1	....	....		1.680
9	3.5	..	....	....		1.275
13.5	4	3	....	....		1.945
13.75	3.75	2	5	....		2.325
6.4	4.5	1.9	....	5		1.185
6	4	3	....	6		1.430
1.5	4	1	....	8.5		1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50**	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	64.50	65.00	65.50	66.00
Tonawanda,N.Y. W12	64.50	65.00	65.50	66.00
N.Tonawanda,N.Y. T9	....	65.00	65.50	66.00
Boston, deld.	75.79	76.29	76.79	....
Rochester,N.Y., deld.	67.52	68.02	68.52	....
Syracuse,N.Y., deld.	68.62	69.12	69.62	....
Chicago District				
Chicago I-3	64.50	65.00	65.00	65.50
S.Chicago,Ill. R2	64.50	....	65.00	....
S.Chicago,Ill. Y1	64.50	65.00	65.00	....
S.Chicago,Ill. W14	64.50	....	65.00	65.50
Milwaukee, deld.	66.96	67.46	67.46	67.96
Muskegon,Mich., deld.	....	78.83	78.83	....
Cleveland District				
Cleveland R2, A7	64.50	65.00	65.00	65.50
Akron,O., deld.	67.62	68.12	68.12	68.62
Mid-Atlantic District				
Birdsboro,Pa. B10	66.50	67.00	67.50	68.00
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	66.50	67.00	67.50	68.00
New York, deld.	....	73.20	73.70	....
Newark,N.J., deld.	70.52	71.02	71.52	72.02
Philadelphia, deld.	68.38	68.88	69.38	69.88
Troy,N.Y. R2	66.50	67.00	67.50	68.00
Pittsburgh District				
NevilleIsland, Pa. P6	64.50	65.00	65.00	65.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	66.45	66.45	66.98
McKeesRocks,Pa., deld.	....	66.10	66.10	66.63
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	66.76	66.76	67.29
Verona,Trafford,Pa., deld.	66.79	67.32	67.32	67.85
Brackenridge,Pa., deld.	67.10	67.60	67.60	68.13
Midland,Pa. C18	64.50	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,O. Y1	....	....	65.00	....
Sharpsville,Pa. S6	64.50	....	65.00	65.50
Youngstown Y1	....	....	65.00	65.50
Mansfield,O., deld.	69.40	....	69.90	70.40
Duluth I-3	64.50	65.00	65.00	65.50
Erie,Pa. I-3	64.50	65.00	65.00	65.50
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	72.50	73.00	....	....
Geneva,Utah C11	64.50	65.00	....	....
GraniteCity,Ill. G4	66.40	66.90	67.40	....
Ironton,Utah C11	64.50	65.00	....	....
Minnequa,Colo. C10	66.50	67.00	67.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	64.50	65.00	65.00	65.50
Cincinnati, deld.	71.04	71.54	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.60%, $59.50.
‡Phos. 0.70-0.90%; Phos. 0.30-0.50%, $60.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$105.50
NiagaraFalls,N.Y. P15	105.50
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	72.50
Philadelphia, deld.	80.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	69.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.17‖	9.37‖	9.83‖	....	8.21	8.45	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.31	....	8.36	8.53	9.13¹	14.68	8.75	8.26	9.76
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	8.84	9.88	9.24	60.42	8.89	9.07	....	14.69	9.10	9.18	10.68
Buffalo	7.85	9.00	10.68	....	8.05	8.25	8.70	14.50	8.50	8.50	10.05
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	7.78	9.00	9.65	53.25	7.82	8.07	8.35	14.15	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.65	50.00	8.14	8.38	8.84	14.46	8.74	8.52	9.78
Cleveland	7.78	8.98	9.55	53.43	7.92	8.16	8.60	14.24	8.57	8.39	9.72
Denver	9.70	11.30	12.49	....	9.80	9.95	10.65	18.89	9.80	9.70	11.40
Detroit	8.03	9.25	10.00	59.50	8.17	8.37	8.70	14.41	8.74	8.51	9.74
Erie, Pa.	7.85	9.00	9.60¹⁰	....	7.95	8.20	8.70¹⁰	....	8.50	8.35	9.75
Houston	8.80	9.75	10.99	....	7.75	8.05	9.15	15.00	8.00	8.80	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.10	12.30	11.25	57.45	9.15	9.20	12.10	15.50	9.15	9.65	11.80
Milwaukee	7.93	9.13	9.93	....	7.95	8.20	8.58	14.28	8.41	8.29	9.62
Moline, Ill.	8.13	9.35	10.05	....	8.17	8.42	8.70	....	8.55	8.51	...
New York	8.45	9.66	10.21	60.20	8.90	9.01	....	14.59	8.91	9.01	10.31
Norfolk, Va.	8.05	...	....	....	8.55	8.60	10.80	....	8.96	8.45	9.95
Philadelphia	8.15	9.07	10.24	50.69	8.82	8.71	9.31	14.51	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.00	50.00	7.92	8.07	8.60	14.15	8.20	8.16	9.49
Portland, Oreg.	9.20	11.20	11.55	55.20	11.05‡‡	9.35	13.80	14.60	9.35	9.00	12.20
Richmond, Va.	8.00	...	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.14	9.34	10.16	73.36	8.19	8.43	8.96	14.51	8.67	8.52	9.86
St. Paul	8.39	9.59	10.26	....	8.43	8.68	9.21	....	8.94	8.90	10.10
San Francisco	9.05	10.40	10.50	53.45	9.06	9.15	12.55	15.60	9.15	9.30	11.55
Seattle	9.55	10.70	11.65	55.20	9.55	9.50	13.40	15.85	9.35	9.30	11.70
Spokane, Wash.	9.55	10.70	11.55	....	9.55	9.50	13.40	16.60	9.35	9.30	11.70
Washington	8.48	9.58	....	....	9.06	9.13	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 11.00c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **½-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle; 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ¹—400 to 999 lb; ⁵—1000 to 1999 lb; ⁸—2000 to 3999 lb; ¹⁰—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Philadelphia, $137; Woodbridge, N.J., $135.

Ladle Brick (per 1000)

Dry Pressed: Ainey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $100; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $72.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60% $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
55-60%	$3.10-3.60
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N.J., west of Mississippi river.	9.50
Sponge Iron, domestic, 98 + % Fe: Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe..	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, fr'ght allowed Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots.	32.00*
Brass, 5000-lb lots	34.30-43.00†
Bronze, 5000-lb lots	52.80-57.20†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh ...	64.00
Minus 100 mesh ...	70.00
Minus 200 mesh ...	75.00
Nickel, unannealed ...	$1.065
Nickel-Silver, 5000-lb lots	52.90-57.20†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	44.50-52.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304 ..	$1.08
Stainless Steel, 316 ..	$1.44
Tin	14.50*
Zinc, 5000-lb lots	18.50-31.70‡
Tungsten: Melting grade, 99% 60 to 2000 mesh: 1000 lb and over ...	Dollars 3.75
Less than 1000 lb ..	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33.78
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	29.27
Kearny, N.J., ovens	29.75
Milwaukee, ovens	30.50
Painesville,O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305...	$7.13	$7.13	$7.13	$7.36
Bar Size Angles	6.77	6.77	6.77	7.00
Structural Angles	6.77	6.77	6.77	7.00
I-Beams	7.17	7.17	7.17	7.41
Channels	7.17	7.17	7.17	7.41
Plates (basic bessemer)	9.00	9.00	9.00	9.30
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.62	26.62	26.62	27.77
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.95	6.95	6.95	7.30
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods Thomas Commercial No. 5.	6.38	6.38	6.38	6.78
Wire Rods, O.H. Cold Heading Quality No. 5.	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	8.38	8.38	8.38	8.58

†Per 82-lb, net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 6c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c: No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3⅛ lb and containing 2 lb of Mn and approx ⅛ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2¼ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; Freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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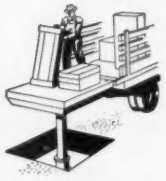

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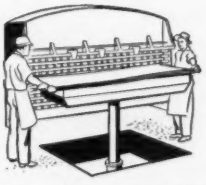

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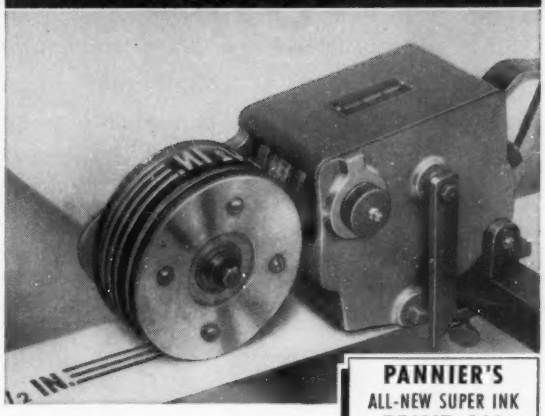

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Broker Covering Pushes Up Scrap

STEEL's composite on the chief steelmaking grades rises another 16 cents to $55.83, highest in months, but tone of market is weaker with consumer buying sluggish

Scrap Prices, Page 120

Philadelphia — With exporters pressing for scrap to meet current commitments, domestic consumers of open-hearth material are buying sparingly. They are content with small amounts they can pick up near their plants at a saving in transportation costs.

Some mills are closing on 100-ton lots; normally, they might be covering on quantities of at least 1000 tons. At larger tonnages, these consumers would be forced to compete with the higher offerings of foreign shippers.

The domestic market on steel scrap is unchanged, except for electric furnace bundles which are slightly higher at $59, delivered. In the cast grades, No. 1 cupola is up $3 a ton to $49, delivered, on buying by pressure pipe producers.

Several district scrapyards and two district mills—Roebling and Alan Wood—are down for mass vacations this week. Alan Wood is still taking in scrap.

New York—Brokers have eased their buying prices on most grades of open-hearth scrap, recent high prices having brought a freer flow of material. They are now offering to buy No. 1 heavy melting and No. 1 bundles at $53-$54 and No. 2 heavy melting at $43-$44. No. 2 bundles, however, are unchanged at $42-$43.

The brokers are paying $2 more for No. 1 cupola cast at $46-$47, and $2 more for unstripped motor blocks at $39-$40. Strength in this latter grade is ascribed primarily to export requirements.

Stainless scrap is unchanged. There is modest buying of nickel bearing material although consumers are exerting no particular pressure. Trading in the 430 and 410 series is dull.

Boston—Higher prices for steel scrap for delivery at dock, export, at $53-$54 for No. 1 heavy melting steel, is attracting tonnage from more distant points for ship loading. For domestic shipment, brokers' buying prices are unchanged and may have reached a high for the next few weeks. The spread between export and domestic shipment is much wider than normal.

Chicago—A weakness has shown up in the scrap market here, and prices on a few grades are off $1 or so a gross ton. Several factors appear to be responsible. Foremost is that a good volume of material is available—dealer offerings exceed market requirements and counteract the higher prices brokers had been paying for scrap to fill old contracts. A second factor: Consumer buying is light. Inventories are good, and a depressed steelmaking rate in July is anticipated. The third: The cur-

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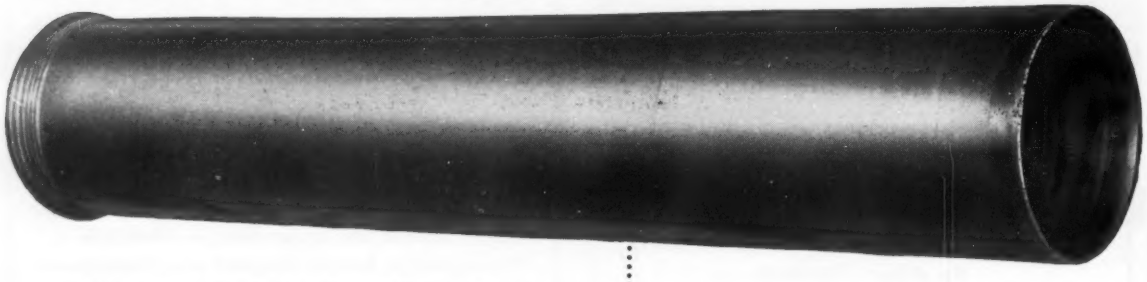

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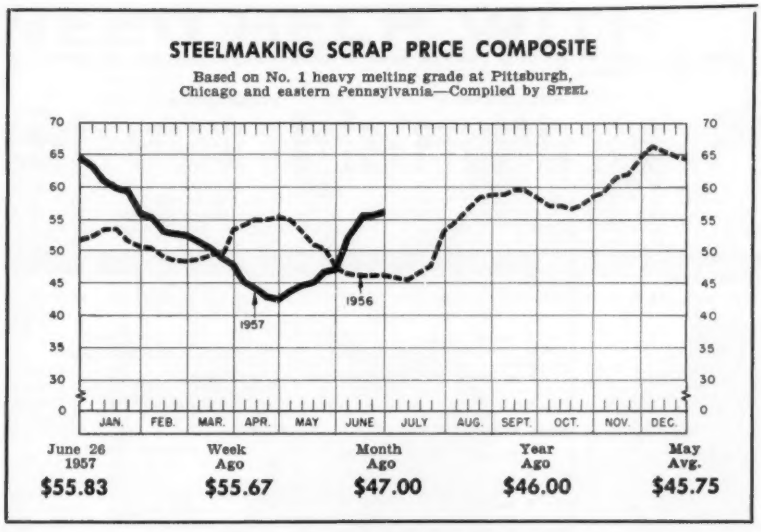

rent operating rate. For the week ended June 23 it was 84.5 per cent of capacity, the lowest point since last year's steel strike. Speculation is it may slip into the seventies in July.

Pittsburgh — Broker buying to cover orders moved the No. 1 heavy melting price up $1 the past week. Other leading grades also advanced, but there was little interest in turnings and borings. They remained steady. Railroad grades tended to become stronger. Mill resistance to higher prices is developing.

Cleveland—The market is at a standstill, pending the outcome of bids on industrial lists which are now closing. Mill buying is absent, and there is virtually no foundry demand. Vacation suspensions will hold down buying over the next several weeks. Prices are unchanged, with No. 1 heavy melting at $51-$52; No. 1 factory bundles at $54-$55; and No. 2 bundles at $43-$44.

Detroit — Brokers and dealers say the scrap market here appears strong. They expect an increase in prices on the No. 1 grades and foundry scrap. No representative purchases are noted.

Youngstown—Scrap traders are less optimistic than they were a week ago. Recent sales at higher prices perked up the market—$55 for No. 1 heavy melting; $54 for No. 1 bundles; $50 for No. 2 heavy melting; and $47 for No. 2 bundles. But with vacations at hand, dealers do not anticipate much in the way of mill buying in this area before the fall.

Buffalo — The scrap market is firm. Prices are unchanged, but dealers anticipate an increase when July delivery orders are placed. Prices here are considerably under those offered elsewhere. As a result, local mills are apt to lose scrap to other markets. Low phos scrap advanced another $2 last week to $54. Other specialties, including railroad items, are firm. Machine shop turnings commanded $35 on a sale to a Niagara Falls consumer.

Cincinnati — The scrap market undertone is somewhat bearish. But prices are unchanged. Dealers are offering tonnage at current prices. A week ago brokers found it difficult to interest them in selling because they anticipated a further price rise. No. 1 heavy melting is quoted at $46-$47.

St. Louis—The scrap market has lost some of its steam. Mill vacation schedules are expected to push prices down $1 or $2 before third quarter buying is resumed. A drop in the Chicago prices reduced demand outside this district.

Extreme scarcity of rerolling rails continues. The price on this item went up $1 last week. Speculative buying of a Missouri-Pacific offering of railroad heavy melting

(*Please turn to page* 125)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, June 26, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 26	$55.83
June 19	55.67
May Avg.	45.75
June 1956	46.04
June 1952	42.63

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*57.00-58.00*
No. 2 heavy melting	*51.00-52.00*
No. 1 factory bundles	*63.00-64.00*
No. 1 dealer bundles	*57.00-58.00*
No. 2 bundles	*49.00-50.00*
No. 1 busheling	*57.00-58.00*
Machine shop turnings	34.00-35.00
Mixed borings, turnings	34.00-35.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Cut structurals:	
2 ft and under	*63.00-64.00*
3 ft lengths	*62.00-63.00*
Heavy turnings	*47.00-48.00*
Punchings & plate scrap	*62.00-63.00*
Electric furnace bundles	*62.00-63.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	34.00-35.00
No. 1 machinery cast	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt	*61.00-62.00*
Rails, 2 ft and under	*72.00-73.00*
Rails, 18 in. and under	*73.00-74.00*
Rails, random lengths	68.00-69.00
Railroad specialties	69.00-70.00

Stainless Steel Scrap

18-8 bundles & solids	*300.00-315.00*
18-8 turnings	*190.00-215.00*
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	51.00-52.00
No. 1 factory bundles	54.00-55.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	51.00-52.00
No. 2 bundles	43.00-44.00
No. 1 busheling	51.00-52.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	49.00-50.00
Cut structurals, plates 2 ft and under	58.00-59.00
Low phos. punchings & plate	54.00-55.00
Alloy free, short shovel turnings	26.00-27.00
Electric furnace bundles	54.00-55.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	41.00-42.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	73.00-74.00
Rails, 18 in. and under	74.00-75.00
Rails, random lengths	68.00-69.00
Cast steel	63.00-64.00
Railroad specialties	65.00-66.00
Uncut tires	63.00-64.00
Angles, splice bars	65.00-66.00
Rails, rerolling	71.00-72.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	300.00-310.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	54.00-55.00
No. 2 heavy melting	49.00-50.00
No. 1 bundles	54.00-55.00
No. 2 bundles	46.00-47.00
No. 1 busheling	54.00-55.00
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	57.00-58.00
Electric furnace bundles	57.00-58.00

Railroad Scrap

No. 1 R.R. heavy melt.	61.00-62.00

CHICAGO

No. 1 heavy melt., indus.	*54.00-55.00*
No. 1 hvy melt., dealer	52.00-53.00
No. 2 heavy melting	*44.00-45.00*
No. 1 factory bundles	*57.00-58.00*
No. 1 dealer bundles	*52.00-53.00*
No. 2 bundles	*41.00-42.00*
No. 1 busheling, indus.	*54.00-55.00*
No. 1 busheling, dealer	52.00-53.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	35.00-36.00
Short shovel turnings	35.00-36.00
Cast iron borings	35.00-36.00
Cut structurals, 3 ft.	*55.00-56.00*
Punching & plate scrap	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	45.00-46.00
Unstripped motor blocks	*35.00-36.00*
Clean auto cast	*51.00-52.00*
Drop broken machinery	*51.00-52.00*

Railroad Scrap

No. 1 R.R. heavy melt	*56.00-57.00*
R.R. malleable	62.00-63.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Angles, splice bars	67.00-68.00
Rails, rerolling	74.00-75.00

Stainless Steel Scrap

18-8 bundles & solids	315.00-320.00
18-8 turnings	215.00-220.00
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	33.00-34.00
No. 1 bundles	46.00-47.00
No. 2 bundles	33.00-34.00
No. 1 busheling	45.00-46.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	56.00-57.00

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	41.00
Stove plate	41.00
Heavy breakable	36.00
Unstripped motor blocks	28.00
Clean auto cast	48.00
Malleable	52.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	45.50
No. 2 heavy melting	43.00
No. 1 bundles	45.50
No. 2 bundles	38.00
No. 1 busheling	45.50
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	40.00
Heavy breakable cast	40.00
Unstripped motor blocks	40.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	*55.50*
Rails, 18 in. and under	74.00
Rails, rerolling	*72.00*
Rails, random lengths	67.00
Angles, splice bars	62.00

PHILADELPHIA

No. 1 heavy melting	56.00-57.00
No. 2 heavy melting	48.00-49.00
No. 1 bundles	58.00
No. 2 bundles	48.00-50.00
No. 1 busheling	58.00
Electric furnace bundles	*59.00*
Mixed borings, turnings	40.00†
Short shovel turnings	42.00
Machine shop turnings	39.00
Heavy turnings	52.00-53.00
Structurals & plate	59.00-61.00
Couplers, springs, wheels	66.00
Rail crops, 2 ft & under	70.00-72.00

Cast Iron Grades

No. 1 cupola	*49.00*
Heavy breakable cast	55.00
Malleable	62.00
Drop broken machinery	57.00-58.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*53.00-54.00*
No. 2 heavy melting	*43.00-44.00*
No. 1 bundles	*53.00-54.00*
No. 2 bundles	42.00-43.00
Machine shop turnings	29.00-29.50
Mixed borings, turnings	29.00-29.50
Short shovel turnings	31.00-32.00
Low phos. (structural & plate)	55.00-56.00

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Unstripped motor blocks	*39.00-40.00*
Heavy breakable	*46.00-47.00*

Stainless Steel

18-8 shets, clips solids	280.00-290.00
18-8 borings, turnings	180.00-190.00
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	37.00-38.00
No. 1 bundles	43.00-44.00
No. 2 bundles	35.00-36.00
No. 1 busheling	42.00-43.00
Machine shop turnings	25.00-26.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	30.00-31.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	46.00-47.00
No. 2 bundles	36.00-37.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	35.00-36.00
Machine shop turnings	33.00-34.00
Short shovel turnings	36.00-37.00
Cast iron borings	35.00-36.00
Low phos.	*53.00-54.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
No. 1 machinery	50.00-51.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	46.00-47.00
No. 2 bundles	39.00-40.00
No. 1 busheling	46.00-47.00
Machine shop turnings	30.00-31.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	33.00-34.00
Cast iron borings	28.00-29.00
Low phos. 18 in.	54.00-55.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	52.00-53.00
Rails, 18 in. and under	70.00-71.00
Rails, random lengths	62.00-63.00

BIRMINGHAM

No. 1 heavy melting	48.00-49.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	48.00-49.00
No. 2 bundles	36.00-37.00
No. 1 busheling	48.00-49.00
Cast iron borings	28.00-29.00
Short shovel turnings	38.00-39.00
Machine shop turnings	37.00-38.00
Bar crops and plates	*54.00-55.00*
Structurals & plate	*54.00-55.00*
Electric furnace bundles	49.00-50.00
Electric furnace:	
3 ft and under	47.00-48.00
2 ft and under	48.00-49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*53.00-54.00*
Stove plate	*53.00-54.00*
Unstripped motor blocks	43.00-44.00
Charging box cast	34.00-35.00
No. 1 wheels	*43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	53.00-54.00
Rails, 18 in. and under	65.00-66.00
Rails, rerolling	66.00-67.00
Rails, random lengths	59.00-60.00
Angles, splice bars	59.00-60.00

SEATTLE

No. 1 heavy melting	45.00
No. 2 heavy melting	42.00
No. 1 bundles	42.00
No. 2 bundles	26.00
Machine shop turnings	28.00
Mixed borings, turnings	28.00
Electric furnace No. 1	52.00

Cast Iron Grades

No. 1 cupola	48.00
Heavy breakable cast	45.00
Unstripped motor blocks	37.50
Stove plate (f.o.b. plant)	37.00

LOS ANGELES

No. 1 heavy melting	*48.00*
No. 2 heavy melting	43.00
No. 1 bundles	*47.00*
No. 2 bundles	*34.00*
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	*32.00*
Cut structural and plate, 1 ft and under	57.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	43.00
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	34.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	48.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	35.00
Mixed borings, turnings	19.00
Busheling, new factory: Prepared	43.00
Unprepared	37.00
Short steel turnings	30.00
Rails, rerolling	49.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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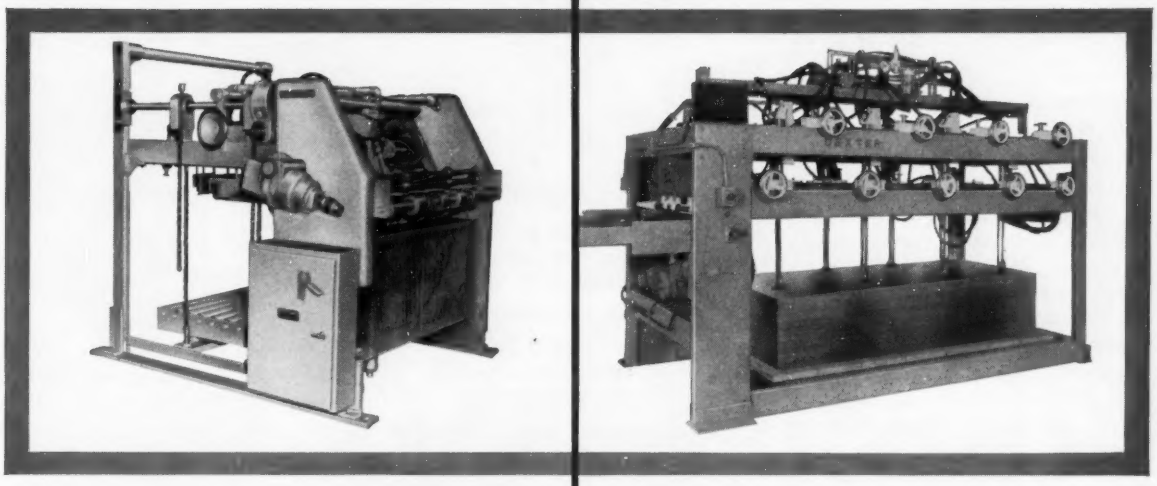

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Lead, Zinc Still Weak

Unless demand picks up or production is curtailed, there's a chance for price cuts in both. Overproduction continues to be copper's biggest problem

Nonferrous Metal Prices, Pages 124 & 125

LEAD AND ZINC producers see no relief for their two major headaches: 1. Lack of demand. 2. Overproduction.

Lead is holding at 14 cents a pound despite the 3 cent a pound differential between domestic quotations and that of the London Metal Exchange (11.2 cents on June 25). The LME price has not dropped as far as expected, which buoys the hopes of some American producers that there won't be a further dip in the domestic price at this time.

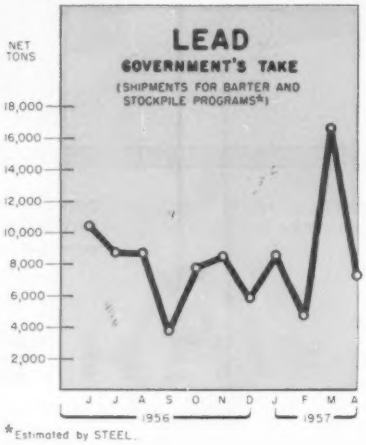
Warning—But one industry observer points out that conditions are the same as they were when the lead quotation last fell (June 11). Some metals men feel the strike at American Smelting & Refining Co.'s Monterrey, Mex., refinery has helped them to hold the price line because it means less lead on the market. AS&R's estimated production has been curtailed around 12,000 tons since the strike began May 27.

Overproduction is more of a villain in zinc, characterized recently by slack demand. Producers report the volume of business at the 10.50 cent level is no better than it was before the June 19 price cut. Some observers say that the only solution is a drastic slash in production. Problem: Once a mine is shut down, it often takes several months to get it back into production. A few producers of lead and zinc have begun mild cutbacks but not enough to affect the market noticeably.

Washington observers say it may be another month (at the least) before anything is done about revising the barter program. And the rumor is that contemplated revisions won't be enough to bring the industry out of the doldrums. Without help from Washington, it's doubtful whether the present zinc price can be maintained.

Too Much Copper

Copper, like lead and zinc, still suffers from overproduction. A few companies have announced



production curtailments, but they are mostly small. Example: Anaconda Co. cut production at its Yerington mines in Nevada by 16 per cent on July 1, but this accounts for only 416 tons a month.

Forecast: Don't look for substantial production cuts by major producers. Some small mines may curtail operations because they can't afford to operate at current quotations. But large companies would rather cut the number of days worked per week than close down a mine because it takes six weeks to six months to get a mine back into production once it's shut down. Possible factor: It's reported the Chilean Copper department may curtail mine production.

Here are the schedules of three major copper companies:

Phelps Dodge Corp.—Open pits are operating 23 out of 24 days. Underground mines are on a six-day week.

Kennecott Copper Corp.—Mines are on a seven-day week, with the exception of the Arizona Division, which is working six.

Anaconda Co. — Mining operations in the U.S. generally are observing the five-day week.

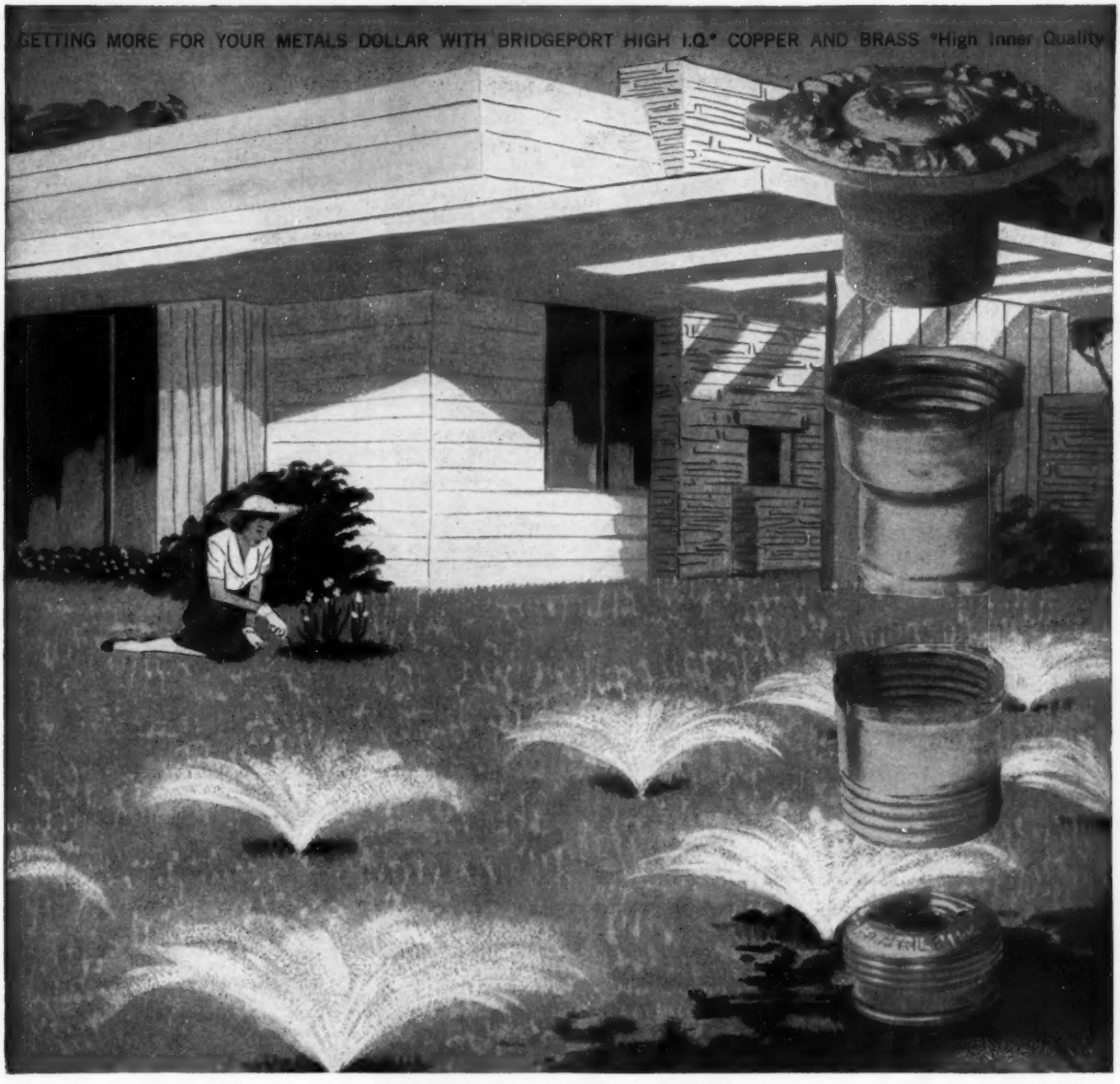
Market Memos

- Producer price nickel is selling well. A few reports indicate the premium product is not keeping pace. Mill requirements have leveled off. Most observers predict the price will hold steady. Some feel prices are too low.
- It's rumored three U.S. copper firms are exploring for ore in the Highland valley and the Mamit lake area of Canada's British Columbia. Two of them, Kennecott Copper and American Smelting & Refining, are reportedly scanning claims of the Bethlehem Copper Corp. Ltd. Phelps-Dodge is said to be working on claims of Jericho Mines Ltd.
- Titanium Metals Corp. of America will open its new titanium rolling and forging plant at Toronto, O., on Sept. 1.

NONFERROUS PRICE RECORD

	Price June 26	Last Change	Previous Price	May Avg.	Apr. Avg.	June, 1956 Avg.
Aluminum	27.10	Aug. 10, 1956	25.90	27.100	27.100	25.900
Copper	29.00–29.25	June 18, 1957	30.00–32.00	31.087	31.598	43.000
Lead	13.80	June 11, 1957	14.80	15.185	15.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	33.750
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	98.375	June 25, 1957	97.50	98.341	99.276	94.611
Zinc	10.50	June 18, 1957	11.00	11.923	13.500	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.



How to "water down" a tough forming and machining problem

Is there a metal ductile enough to undergo severe right-angle forming and drawing without cracking? Can this metal be machine-threaded easily and economically inside—and outside, if necessary—after forming? Can all this be done on *our* machines, the way *we* do it?

These questions were asked by Ross Sprinkler Co., Rosemead, Calif., and answered by Bridgeport Medium Leaded Brass Strip, Alloy #63, 12 B&S Gauge—a *standard* Bridgeport Alloy at a *standard* price. The result? The sprinkler head and accessories you see here—plus a lot of satisfaction and production savings.

To help achieve similar efficiency and economy in your operations take advantage of Bridgeport's expert help and assistance in selecting the alloy best suited to your own production requirements and product end use. Call your nearest Bridgeport Sales Office today.

BRIDGEPORT BRASS

Offices in Principal Cities • Conveniently Located Warehouses

Bridgeport Brass Company, Bridgeport 2, Connecticut
In Canada: Noranda Copper and Brass Ltd., Montreal

matched Bridgeport Brass Alloys *to your job*

Nonferrous Metals

Cents per pound, carlots except at otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.00 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 29.25 deld. Conn. valley; 29.25 deld. Midwest; custom smelters, 29.00; lake, 29.25 deld.; fire refined, 29.00 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 13 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-100 per troy oz, nom.

Palladium: $23-24 per troy oz.

Platinum: $89-95 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $58.06 per lb; sheet, $45.36 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot and prompt, 97.375.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.60.

Zinc: Prime Western, 10.50; brass special, 10.75; intermediate, 11.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.85; special high grade, 12.25 deld. Die casting alloy ingot No. 3, 14.75; No. 2, 15.75; No. 5, 15.25 deld.

Zirconium: Sponge, commercial grade, $10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.75-28.25, No. 12 foundry alloy (No. 2 grade), 20.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.25-24.50; 13 alloy, 0.60 Cu max., 24.25-24.50; 195 alloy, 23.75-25.25; 108 alloy, 21.25-22.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.50; grade 2, 20.75; grade 3, 19.75; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.77, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 34.605; l.c.l, 35.23. Weatherproof, 30,000-lb lots, 35.72; l.c.l., 36.47. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-12.00; wire, $7.50-11.50; forging billets, $6.00-8.10; hot-rolled and forged bars, $6.15-8.40.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.30
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-Finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
Rolled				
1.125-1.500	55.20	53.90	59.00	56.10
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.75	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)
Aluminum: 1100 clippings, 13.00-13.50; old sheets, 9.50-10.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	51.38b	48.61c	....	51.57	25.250	25.250	24.500
Yellow Brass	44.69	32.87d	45.23	47.60	19.125	18.875	17.375
Low Brass, 80%	47.40	47.34	47.94	50.21	21.375	21.125	20.625
Red Brass, 85%	48.36	48.30	48.90	51.17	22.250	22.000	21.500
Com. Bronze, 90%	49.86	49.80	50.40	52.42	23.125	22.875	22.375
Manganese Bronze	52.52	46.69	57.19	....	17.625	17.375	16.875
Muntz Metal	46.94	42.75	....	....	17.875	17.625	17.125
Naval Brass	48.85	43.16	55.91	52.26	17.625	17.375	16.875
Silicon Bronze	55.96	55.15	56.00	57.97e	24.750	24.500	24.750
Nickel Silver, 10%	61.52	63.85g	63.85	....	25.750	25.000	12.875
Phos. Bronze, A-5%	70.47	70.97	70.97	72.15	26.250	26.000	25.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 9.50-10.00; industrial castings, 9.50-10.00.

Copper and Brass: No. 1 heavy copper and wire, 21.50-22.00; No. 2 heavy copper and wire, 20.00-20.50; light copper, 17.75-18.25; No. 1 composition red brass, 18.50-19.00; No. 1 composition turnings, 18.00-18.50; yellow brass turnings, 10.75-11.25; new brass clippings, 17.00-17.50; light brass, 10.50-11.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 14.50-15.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.50-15.00; brass pipe, 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plates, 4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 45.00-53.00; old sheets, 44.00-53.00; turnings, 35.00-43.00; rods, 45.00-53.00.

Nickel: Sheets and clips, 85.00-90.00; rolled anodes, 85.00-90.00; turnings, 70.00-75.00; rod ends, 85.00-90.00.

Zinc: Old zinc, 3.00-3.25; new die-cast scrap, 2.75-3.00; old die-cast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.00; 3003 clippings, 16.50-17.00; 6151 clippings, 16.50-17.00; 5052 clippings, 16.50; 2014 clippings, 15.50-16.50; 2017 clippings, 15.50-16.50; 2024 clippings, 15.50-16.50; mixed clippings, 15.00-15.50; old sheets, 13.50; old cast, 13.50; clean old cable (free of steel), 16.00-16.50; borings and turnings, 14.00-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 25.00; No. 2 heavy copper and wire, 22.875; light copper, 20.625; refinery brass (60% copper) per dry copper content, 23.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 25.00; No. 2 heavy copper and wire, 22.875; light copper, 20.625; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.50; yellow brass turnings, 14.50; radiators, 16.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 47.54; oval 45.75, 5000-10,000 lb; electrodeposited, 39.25, 2000-5000 lb lots; cast, 43.00, 5000-10,000 quantities.

Nickel: Depolarized, less than 100 lb, 101.50; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 116.50; 200-499 lb, 115.00; 500-999 lb, 114.50; 1000 lb or more, 114.00.

Zinc: Balls, 18.59; flat tops, 18.25; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums. **Chromic Acid:** 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-1000 lb, 77.50.

Copper Sulphate: 100 lb, 24.35; 200 lb, 21.35; 300 lb, 20.35; 400 lb, 19.85; 500 lb, 18.35; 2000 lb, 16.10; 6000 lb, 15.85; 12,000 lb, 15.60, f.o.b. shipping point.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400 lb, 35.50; 5000 lb, 33.50; 20,000 lb, 33.00; 36,000 lb, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 77.40; 100-600 lb, 68.20; 700-1900 lb, 65.50; 2000-9900 lb, 63.60; 10,000 lb or more, 62.3.

Stannous Chloride (anhydrous): Less than 25 lb, 167.10; 25 lb, 132.10; 100 lb, 117.10; 400 lb, 114.70; 5200-19,600 lb, 102.50; 20,000 lb or more, 90.30.

Stannous Sulphate: Less than 50 lb, 129.80; 50 lb, 99.80; 100-1900 lb, 97.80; 2000 lb or more, 95.80.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(*Concluded from page* 119)

lifted the price on that grade $1.50.

Birmingham—Activity slackened in the scrap market here last week. Brokers attribute the lull to improved mill inventories and impending shutdowns for vacations. Dealers think prices will go higher. While they are filling old orders at current market prices, they are resisting lower offerings. More scrap is coming into yards, but dealers say inventories are still below normal.

Los Angeles — Scrap prices ad-

Galvanizing Worries?
End Them by Contacting—
NATIONAL GALVANIZING COMPANY

Who will:

1. Do your galvanizing for you in the world's most modern and efficient galvanizing plant (which we would like you to consider your own private galvanizing department).
   OR
2. Build and operate complete job galvanizing facilities in your city.
   OR
3. Engineer and install modern, low-cost facilities to replace outmoded galvanizing operations.

NATIONAL GALVANIZING COMPANY
4000 Grand Avenue
Pittsburgh 25, Pa.
Galvanizing facilities to process
200 tons of job work per day

GET CASH NOW
for your new surplus motors, controls and transformers!
NEW MOTORS AVAILABLE:
Over 5,000 new motors, in stock, from ¼ HP to 200 HP.
Special low prices.
Write, wire or phone collect!

AJAX ELECTRIC MOTOR CORP.
P.O. Box 262, Rochester, N.Y.
Long Distance Phone LD. 132

CLASSIFIED

Positions Wanted

TWENTY-NINE YEARS CONTINUOUS EXPERIENCE in fabricated structural steel, plate work, miscellaneous and ornamental iron work, stainless steel and aluminum. Thoroughly experienced in all phases of sales, estimating, design and production. Capable of taking complete charge any one or all departments. Age 49 years, married, best references. Prefer location in South or West. Could be available in 30 days. Write Box 564, STEEL, Penton Bldg., Cleveland 13, Ohio.

BUSINESS EXECUTIVE with many overseas contacts, 30 years management experience, will represent you in Europe. Buying, selling, investigating. Salary secondary consideration. Box 566, STEEL, Penton Bldg., Cleveland 13, Ohio.

GIANT GEAR PLANER
(GLEASON)

Manufactured 1943
"Like-New" Condition

12' O.D. Capacity-20" stroke

Complete with pump, tooth setting gauge, grating, pop chucks indexing mechanism, control panel, etc.

STILL ON LOCATION ! !

S & S Machinery Co.
140 53 St., Bklyn 32, N.Y.
HYacinth 2-7400
Ask for J. B. Srybnik

We Own and Offer For Sale At Bargain Prices

85 — Open Hearth Charging Cars Standard Gauge with Std. Couplers 8'2" long—6'9" Wide—24" high—Rail to Deck.
All Cast Steel—Heavy Duty
Excellent Condition
Phone — Wire — Write
HYMAN-MICHAELS CO.
2039 E. Broadway
East St. Louis, Ill.
Phone: Bridge 1-6300

FOR SALE

Ajax Electrothermic High Frequency Induction Melting Installation. Excellent condition. Complete with 250 KW, MG Set, 100#, 650# and 1000# Furnace shells, spare coils and all necessary electrical equipment. Available by Oct. 1.

Box 567, STEEL
Penton Bldg. Cleveland 13, Ohio

MACHINE TOOLS WANTED!

#30 FOSDICK Jig Borer—
or equivalent
#2A PRATT & WHITNEY—Models #2430 or #3644—or equivalent.

S & S MACHINERY CO.
140 53 St., Bklyn, N.Y.
HYacinth 2-7400
Write or call
Mr. Andrew Schirmer

(*Concluded from page* 125)

vanced slightly last week, averaging $2 a ton. Steelmaking operations at major mills were reported in excess of 100 per cent of capacity.

Seattle—A firmer tone has developed in the scrap market here following recent price reductions. Higher prices in the East are reflected to some extent. Expectations are that local quotations will advance this month. Demand is strong and receipts at dealers' yards are ample. Exporters are marking time.

San Francisco—The local scrap market is under pressure, both up and down. Mill buying has lightened in keeping with reduced operations, and this tends to exert a downward pressure on prices. At the same time, export demand continues strong with instances of above-posted prices being paid for top grades.

RAILS, CARS . . .

RAILROAD CARS PLACED

Venezuelan railroad, thirty-five 50-ton hopper cars, five 40-ton flatcars and three 40-ton boxcars, to Magor Car Corp., New York.

National of Mexico, 100 caboose cars, to ACF Industries Inc., New York.

Sacramento Northern, twenty 70-ton drop bottom gondolas, to ACF Industries Inc., New York.

Consolidated of Cuba, 250 fifty-ton boxcars, to ACF Industries Inc., New York.

Kaiser Aluminum & Chemical Corp., 24 gondola cars with all-welded aluminum bodies, to Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 50 tankcars, to General American Tank Car Corp., Chicago.

Grand Trunk Western, 15 caboose cars, to International Railway Car Co., Buffalo.

Norfolk & Western, 15 caboose cars, to International Railway Car Co., Buffalo.

Florida East Coast, six 50-ton flatcars, to Thrall Car Mfg. Co., Chicago Heights, Ill.

Tidewater Southern, 10 insulated boxcars, to Pacific Car & Foundry Co., Renton, Wash., and five 70-ton drop-bottom gondola cars, to ACF Industries Inc., New York.

Canadian National, three rail-diesel cars, to the Budd Co., Philadelphia.

Canadian Pacific, one rail-diesel car, to the Budd Co., Philadelphia.

PLATES . . .

PLATES PLACED

1200 tons, 6.5 miles of water pipe for Aberdeen, Wash.; to Beall Pipe & Tank Corp., Portland, Oreg.

PLATES PENDING

1625 tons, Green Springs power plant, Rouge river project, Oregon; Wiemer, Becker & Lord, Sacramento, Calif., low at $1,802,368 to Bureau of Reclamation.

150 tons, 750,000-gal storage tank; Hydraulic Supply Mfg. Co., Seattle, low at $54,804 to District No. 68, Bellevue, Wash.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 14, 10 and 6-in., Marysville, Wash., to Pacific Cast Iron Pipe Co., Seattle.

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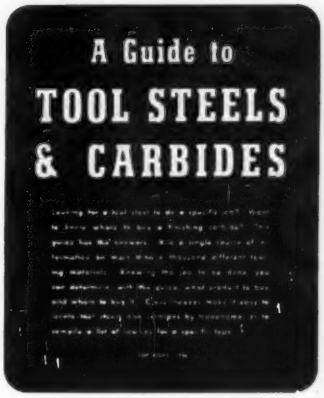

HERE'S HELP for your tooling problems

Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

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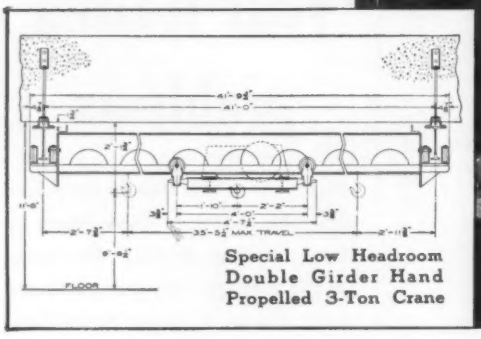
51 to 100	1.80 ea.
101 to 200	1.70 ea.
over 200	1.60 ea.

3 ton, 41'-0" span Cleveland Tramrail double-girder hand-propelled crane with electric hoist handling a heavy electrical machine.



Special Low Headroom Double Girder Hand Propelled 3-Ton Crane

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A MANUFACTURER of heavy electrical equipment ran against a serious production problem because of its rapid growth and inability to expand its building area.

An overhead crane was felt to offer a way of alleviating the situation. Conventional crane designs were studied, but they were unable to provide height of lift required by 24 inches or more.

The solution was found in a special Cleveland Tramrail crane of low-headroom design. This crane has two girders spread apart so the trolley can operate between them and also permit the hoist hook to be raised above the bottom of the girders.

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Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO., 7827 E. 290th St., Wickliffe, Ohio

The Spirit of a Company

•

How do you measure or evaluate the spirit of a company?

By physical facts — size, number of plants, number of employees?

Or by accomplishments — the amount of sales, the outstanding installations, the new products?

Or by the intangibles — the reputation, the respect of the industries served, the interest of the company in their customers?

No one ever has defined specifically the spirit of a company, yet every company with which you do business has a certain identifying spirit.

•

What is the spirit of Aetna-Standard as we see it ourselves?

The ability to do a job well.

The courage to design equipment in the face of competitive bidding without diluting the ruggedness and the extra components for the sake of a price.

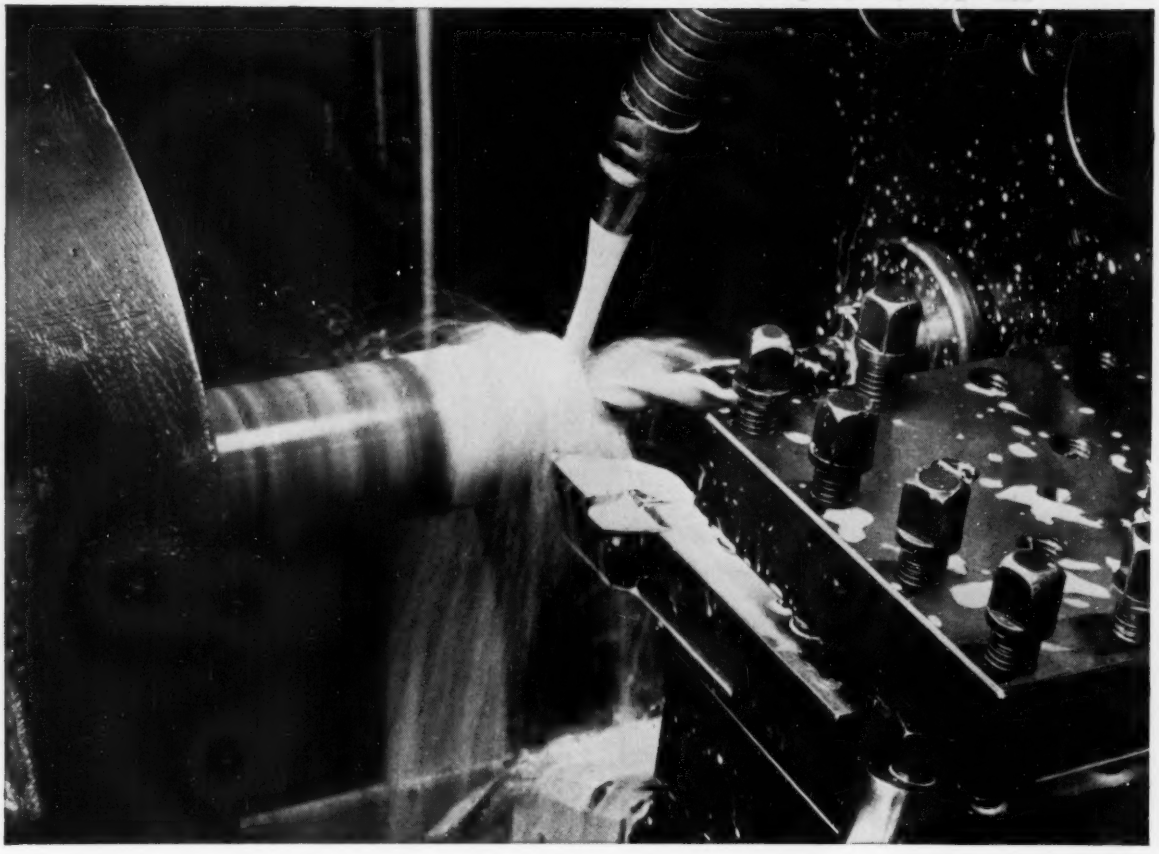
The strength to pioneer in ideas.

The perseverance to say "no" when "yes" would be much easier.

The awareness of the importance of customers.

The Aetna-Standard Engineering Company

Ellwood City, Pa. Pittsburgh, Pa. Warren, Ohio.



How to get full value from your automatic machine tools...at no extra cost

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We're steelmakers because we need the finest quality steel for Timken bearings. The Timken steel you buy must meet these same exacting standards. Always specify Timken fine alloy steel. You'll get time and money-saving uniformity, a more uniform finished product. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable: "TIMROSCO".

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